The Chemical Age

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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"THE CHEMICAL AGE" INDEX

With this issue is published the Index to Volume XV of THE CHEMICAL AGE, *covering the period July–December, 1926.*

The Progress of Fuel Research

IN the period that has elapsed since the formation of the Fuel Research Board there has been opportunity for the selection of the problems most urgently in need of investigation, and for the planning of a proper programme of work. The report of the Board for 1925 bears evidence that the work undertaken has been established on a solid basis. The question of the commercial possibilities of low temperature carbonisation does not now seem to be so remote from settlement as many had thought, although on this as on other points the Board still speaks with caution.

In the 1924 report of the Board it was stated that "a simple continuous vertical retort has now been elaborated, which is working smoothly and producing tar and cokes, while the labour required to run the plant is reduced to an amount comparable with ordinary gasworks practice. Though this plant appears very hopeful, a concluded opinion cannot be formed on its industrial value until it has been working steadily for a long period." The retorts in question are vertical cast iron ones, designated in the 1925 report as the "B" type. Certain difficulties have developed in its operation owing to distortion due to the temperatures used, and the construction of retorts from special materials is now being considered, in order to determine finally the possibilities of this type of retort. On the subject of low temperature carbonisation the present report sums up as follows: "It is necessary, if reliable results are to be obtained, to work with full-size retorts. Such retorts take some months to erect, and the results of working under any particular conditions of temperature, throughput, etc., can only be ascertained after working for an extended period. The problem can only be considered solved when a full size unit plant has been in steady operation for a period sufficient to prove that the depreciation and maintenance of the retort is sufficiently low to make commercial working possible. A few weeks or months may be sufficient to prove that a plant is *not* commercial, but some years are necessary to give a proof that it is really satisfactory."

The investigation of low-temperature tar, which has now been taken in hand, falls naturally into two parts, the first being that of the treatment of the tar in bulk, with a view to its utilisation as a fuel oil, and the second a laboratory investigation of the constituents of the tar, and its possible use as a source of fine chemicals, paints, etc. The second group of investigations is being carried out more particularly at the new Chemical Research Laboratory, directed by Dr. G. T. Morgan, at Teddington, and a paper on the first results was communicated to the Manchester Tar Conference last November.

The importance of the work on low-temperature carbonisation should not, however, be allowed to overshadow the numerous other investigations that are being carried out under the ægis of the Board. The work at the Royal Naval Cordite Factory on the production of alcohol from cellulosic materials by bacteriological methods has been continued, and a by-product of the investigation has been the preparation from straw, etc., of a binder for briquette making. This is mentioned in very guarded terms, but if it comes up to expectations it may have important bearings on the production of fuel from coal-dust. The Physical and Chemical Survey of National Coal Resources has been developed and extended. The methods of sampling and analysing coal adopted by the Fuel Research Department are of growing importance, as there is an increasing tendency by foreign buyers to purchase to a specification. Finally, mention may be made of the investigations on the enrichment of coal gas by the injection of oil into the retorts during carbonisation. It is clear that the Board is taking a very long view of its work: it is pursuing a carefully thought out plan, without allowing itself to be deterred by difficulties or flustered by occasional criticism. Both for the results already achieved, and for the promise of the future, it deserves congratulation.

Destructive Distillation of Oil Shale

KNOWLEDGE of the chemistry of pyrolysis (the breaking down by heat) and pyrogenesis (the formation by heat) of organic substances is being rapidly extended through the growing use of these principles in the cracking of oils and in the industries of coal distillation and gas manufacture. The thermochemical reactions in the destructive distillation (retorting) of oil shales are similar to those that occur in cracking oil and in carbonising coal. The retorting of oil shale is similar to the low-temperature distillation of coal in that the products are a carbon residue containing a relatively high percentage of volatile matter, a small yield of gas, and a large yield of oil. High-temperature distillation of oil shale or coal gives a carbon residue having a low proportion of volatile matter, a large quantity of fixed gas, and a small quantity of oil. The oil produced by low-temperature distillation is much more easily refined to yield petroleum substitutes. The fixed carbon that remains in the spent shale corresponds to petroleum still-coke or to the coke from the carbonisation of coal; the amount of volatile matter present in the coke is reduced as the temperature of distillation is raised.

The first action of heat on oil shale is the removal of the occluded gases that are present in small quantities. Also, in some shales low temperatures remove traces of light oil that may have been present as such or perhaps, prior to its decomposition, as resin or bitumen. As the temperature is raised, the organic matter of the shale decomposes and produces vapours which condense to form shale oil. Simultaneously, fixed gases are evolved. When the organic matter of the typical shale is heated, it changes first into a soluble bitumen and, as the heating continues, this bituminous substance further breaks down or " cracks " and forms shale oil. Whether all shales yield a bituminous substance of this kind as a primary decomposition product is not definitely known yet. Some of the rich shales yield less bitumen than leaner shales when both are subjected to the same temperature and period of heating. A possible explanation of this paradox is that these richer shales produce a larger amount of bitumen that is less stable and therefore breaks down quickly into vapours and gases.

Little is known of the ingredients or the chemical composition of the oil-yielding substance in oil shale, but recent investigations by the U.S.A. Bureau of Mines have shown that it is complex, that it is composed mainly of the elements carbon, hydrogen, oxygen, sulphur, and nitrogen, and that its composition differs in different shales. Since the proportions of these elements are not the same in all shales, it is probable that the chemical composition of most shale oils varies likewise. The Bureau has centred its experimental work largely upon the development of retorting conditions that will obtain from shales the largest yields of the desired products. In general, these products are those that can be substituted for petroleum products and can be made and refined with the smallest loss and by the simplest operations. The work done has shown that the conditions which can be controlled easily during retorting—time, temperature, and pressure—influence greatly the chemical and physical properties and the yields of the crude oils obtained from oil shales. The organic matter (kerogen) of the shales breaks down to form oils of higher quality when the retort temperature is low. Although most shales apparently begin to give off vapours at 300 to 375° C., these same shales will slowly decompose and yield oil at temperatures as low as 100 to 200° C. To retort the shales completely at such low temperatures, however, would require many hundreds of years. The whole matter is treated in Bulletin 249, *Manual of Testing Methods for Oil Shale and Shale Oil*, which may be obtained from the Bureau of Mines, Department of Commerce, Washington, D.C.

Chemicals at the B.I.F.

THE organisers of the British Industries Fair are to be congratulated on having published the advance edition of the catalogue of the London Section of the Fair six weeks before the opening date, Monday, February 21. Only the readiness of the British manufacturer to participate in the Fair, resulting in the complete booking of all the space available, has made this desirable result possible. The Overseas Trade Department, we understand, is using every means to place the advance edition in the hands of overseas buyers in all countries where time will allow of their studying the catalogue before making their journey to England. It should, for example, be possible for a Chicago buyer to make all necessary notes as to the exhibits he wishes to inspect before leaving his home on his way to the Fair.

The Chemical Section of the Fair will, as in previous years, occupy the hall, the entrance to which is in the Uxbridge Road. This section, as in the past, is being organised by the Association of British Chemical Manufacturers, and with the experience that Mr. Woolcock has now had in this matter, it is quite safe to predict that the arrangements will be entirely satisfactory. In the " Chemical and Allied Products Section," the chemical exhibits will be classified under various heads, such as analytical and research chemicals, disinfectants, dyes and intermediates, fertilisers, heavy chemicals, insecticides, photographic chemicals, soap, etc. The domestic chemical products section includes cleansing preparations, laundry materials, and polishes. In addition, there are departments comprising druggists' sundries and drugs, pharmaceutical and toilet preparations. It is interesting to notice that Imperial Chemical Industries, Ltd., are exhibiting for the first time under their own name instead of under the names of the four constituent companies. Their combined exhibit is, therefore, likely to be the great feature of the exhibition. During the past few weeks the staffs of the respective companies have been collaborating in the organisation of the exhibit. The main object is to make an expression of Imperial Chemical Industries' individuality as one group, at the same time showing the inter-connection of the different companies comprising the merger, and pointing out to overseas buyers, the chemical trade in general, and the public at large the advantages derived by the amalgamation of the various interests. Judging from the catalogue, the chemical section will be fully as representative as in previous years, and there is every expectation that its success

will certainly not be below the high standard of recent years.

Nitrogen Fixation in America

THE annual report of the United States Secretary of Agriculture states that during the past year contact with the nitrogen fixation industry has been maintained by the Fixed Nitrogen Research Laboratory at Washington. The industry has been served through the usual channels of publication, and the laboratory has been conducting various investigations in order to furnish further fundamental data. A number of the technical staff have left the department to enter the synthetic ammonia industry.

Progress in nitrogen fixation in the year 1925-26 is described as encouraging. About half a dozen industrial plants are now in operation in various parts of the country and others are planned or under construction. The combined capacity of these plants is nearly sufficient to furnish all the ammonia needed in the country for the refrigerative and chemical industries. The point appears to have been reached where a decision must soon be made as to whether the industry is to expand into the field of nitrogen fertilisers on a large scale. While this step encounters competition from by-product ammonia producers, agriculture seems likely to profit by this competition through price reductions. A synthetic ammonia plant, mentioned in the previous annual report as having been installed to use the process developed at the Fixed Nitrogen Research Laboratory, has now been in full operation for more than a year. The mechanical design as well as the catalyst and other features have proved satisfactory. While cost data are not yet available, it is estimated that the cost of production has been low.

The laboratory has continued during the past year to investigate the important subject of urea synthesis. Now that it is known that ammonia can be synthesised at a favourable cost, the next most important step is to be able to convert it economically into one of the various forms suitable for fertiliser use. Urea is regarded in America as one of the most attractive of the possibilities, since carbonic acid, the only other chemical needed besides ammonia, can be cheaply obtained. The problem consists in working out a continuous process that will be sufficiently economical. The investigation is still in the stage where the different unit operations are being studied, and it is too early to predict what the result will be when the entire cycle is put into operation. The engineering division of the laboratory has just completed the design of a laboratory compressor to operate at 1,000 atmospheres. The compressor will be used in studying catalytic processes at high pressures.

The Faraday Oxford Conference

THE Faraday Society may be congratulated on the excellent programme it is arranging for its Oxford Conference in April on "The Theory of Strong Electrolytes." On the first day, Friday, April 22, the subject for discussion will be "Ionic Mobility," and on the Saturday "Activity of Strong Electrolytes." Among those who have signified their intention of attending are Professor A. J. Allmand (London), Professor J. N. Brönsted (Copenhagen), Professor N. J. Bjerrum (Copenhagen), Professor J. A. Christiansen (Copenhagen), Mr. C. R. Bury (Aberystwyth), Professor F. G. Donnan (London), Mr. R. H. Fowler (Cambridge), Professor K. Fajans (Munich), Dr. H. Goldschmidt (Oslo), Mr. H. B. Hartley (Oxford), Professor G. von Hevesey (Copenhagen), Dr. E. Hückel (Zurich), Professor T. M. Lowry (Cambridge), Professor A. W. Porter (London), Mr. H. R. Raikes (Oxford), Dr. E. K. Rideal (Cambridge), Dr. N. V. Sidgwick (Oxford), Dr. Ulich (Rostock). In addition, contributions to the proceedings have been promised by Professor P. Debye (Zurich), Dr. C. A. Kraus (Worcester, Mass.), Dr. D. A. MacInnes (Cambridge, Mass.), Professor J. R. Partington (London), Professor W. C. McC. Lewis (Liverpool), some of whom hope to attend the meeting. Members will be accommodated at Exeter and Lincoln Colleges. The accommodation at the disposal of the society is strictly limited, so that early application is advisable.

The Calendar

Jan.		
18	Hull Chemical and Engineering Society: "The Lodge-Cottrell Electrical Precipitation Process." H. W. C. Henderson. 7.45 p.m.	Grey Street, Park Street, Hull.
19	Electroplaters' and Depositors' Technical Society: "Electrodeposited Coatings for Prevention of Corrosion." H. Sutton. 8.15 p.m.	Northampton Polytechnic Institute, Clerkenwell, London.
19	Society of Glass Technology:	Manchester.
19	Royal Society of Arts: "Development of the Petroleum Industry in Persia." Sir John Cadman. 8 p.m.	John Street, Adelphi, London.
19	Institute of Chemistry (Bristol Section): "Researches on the Nutrition of Fruit Trees." T. Wallace. 7.30 p.m.	University, Woodland Road, Bristol.
20	Chemical Society: Ordinary Scientific Meeting. 8 p.m.	Burlington House, Piccadilly, London.
20	Co-ordinating Committee of The Staffordshire Iron and Steel Institute, The Birmingham Metallurgical Society and Institute of Metals: "Refractories." Professor W. G. Fearnsides. 7 p.m.	Girls' High School, Dudley.
20	Institute of Chemistry and Society of Chemical Industry (Edinburgh Sections): "The Importance of Fuel Research in the Coal Problem." Dr. C. H. Lander. 7.30 p.m.	36, York Place, Edinburgh.
21	West Cumberland Society of Chemists and Engineers: "An Efficient Accident Prevention Organisation in Industry." C. G. Ingall. 7 p.m.	Workington.
21	Society of Chemical Industry (Glasgow Section): Meeting, 7 p.m.	39, Elmbank Crescent, Glasgow.
21	Society of Dyers and Colourists (Manchester Section): "Modern Industrial Chemistry." R. S. Horsfall.	Manchester.
21	Society of Dyers and Colourists (London Section): "Some Applications of Vat Colours." L. Smith.	London.
21	Wolverhampton Engineering and Scientific Club: "Rust Resisting Steel." Dr. W. H. Hatfield.	Wolverhampton.
21	Institute of Chemistry (Glasgow Section). Joint meeting with the Society of Chemical Industry: "Cylinder Oils." J. W. Donaldson.	Glasgow.
22	Society of Chemical Industry and Institute of Chemistry (Birmingham Sections): Annual Dinner.	Queen's Hotel, Birmingham.

Annual Report of the Fuel Research Board

Progress of Work on Low Temperature Carbonisation

The Department of Scientific and Industrial Research has just issued the "Report of the Fuel Research Board for 1925" (H.M. Stationery Office, pp. 79, 1s. 3d.), together with the report of the Director of Fuel Research. Below is given an account of the main points of interest of the publication.

THE report of the director, Dr. C. H. Lander, for the period ended December 31, 1924, gave a general review of the operations since the institution of the Government organisation for Fuel Research in 1917. During the year 1925 an extension of the laboratory has been taken into use, and this, together with an increase in the staff, has made it possible for certain members to carry on uninterruptedly with special laboratory investigations, while maintaining a specialised grouping of the apparatus, especially that for the more routine analyses, etc., required for the control of the large scale work. The increase in the funds made available for the work generally has enabled more investigations to be undertaken, but sufficient time has not yet elapsed for the full benefit to be obtained in the form of results.

The physical and chemical survey of the national coal resources has been continued. The work in the different areas is supervised by local committees, the members of which include colliery engineers, together with representatives of the Geological Survey and of outside scientific interests. Three more committees have been formed for work in the Scottish, North Staffordshire, and Nottinghamshire and Derbyshire areas respectively, and arrangements are now being made for the staff and laboratory accommodation necessary before field work can begin. Experience has shown that the methods of analysis recommended in the Interim Report issued in 1923 are in the main satisfactory, and it is hoped to issue a final report at an early date.

Low Temperature Carbonisation

The investigations of the Fuel Research Division on low temperature carbonisation have been undertaken from two points of view—first an investigation into carbonisation in general and low temperature carbonisation in particular, in order to provide data which are made generally available, and secondly to develop if possible a system of low temperature carbonisation on a commercial scale such as would be suitable for a large proportion of the coals available in this country and which would provide a lump smokeless fuel to replace raw coal for domestic purposes. For the first purpose horizontal mild steel retorts are in use. Attempts at the Fuel Research Station to develop a commercial scale plant have recently been confined to investigating cast iron vertical retorts with external heating, as internally heated retorts are being adequately experimented with elsewhere. Close touch has been maintained with individuals and firms developing other types.

Various cast iron vertical retorts have been tried, and when all the information possible has been obtained from them it may be desirable to erect fresh retorts of special metal to withstand higher temperatures; and it should then be possible to ascertain definitely what commercial prospects are held out by this type of retort. The question of the most suitable metal to use is being investigated, with the co-operation of the British Cast Iron Research Association and Professor H. C. H. Carpenter.

Summary of Results

From the results obtained it would appear that, given a suitable metal for the retorts, there is no difficulty in producing a lump coke for domestic use from a suitable blend of coal when charged in reasonably small sizes. The more intimate the blending the more homogeneous and stronger will be the resulting coke, but for intimate blending the coal must be of small size, and this prevents the free and rapid escape of the vapours which is essential for high yields of tar. The type of retort in question is quite satisfactory for carbonising lump coal, provided it is not too strongly swelling. An alternative is the production of briquettes of suitable blends, but this adds to the expense, and the binder presents a difficulty. Work on these lines, but using an internally heated retort, is being pursued by Leigh Smokeless Fuels, Ltd., using the Sutcliffe Speakman method of briquetting under high pressure without binder.

There have been suggestions for preparing binding material from straw and other vegetable substances. Should experiments be successful in providing a cheap and smokeless binder it makes possible the preparation of briquettes before carbonising, so that the maximum oil yield should be obtained, and good lump coke produced from fine coal. For this purpose retorts such as the "B" retorts in use at the research station should be quite suitable even without the use of any very special material for the retorts. Alternatively, the availability of such a binder would make it possible to utilise other types of retorts in which the coal is stirred up, and which produce good tar yields, but coke of small sizes, and to briquette the resulting coke into lumps suitable for all purposes.

Outside Tests

During 1925 three tests were made under the arrangement whereby the Fuel Research Board tests and reports upon methods which are being investigated elsewhere. These tests were as follows: (1) The plant of the Midland Coal Products, Ltd., at Netherfield, Nottingham, of which a report has been published. The plant is of the continuous working internally heated type. The coal used was a washed top hard ½ in. slack, from Kirkby, near Nottingham, the slack being first briquetted. The yields per ton of briquettes were:—Coke, 7½ cwt.; gas, 112.5 therms, calorific value, 193 B.Th.U. per thermal unit; tar, 21 gallons, which was about 63 per cent. pitch. The coke contains up to 15 per cent. of breeze, the large pieces being strong and compact, and well suited for use in stoves. (2) The Freeman Multiple Retort (British Oil and Fuel Conservation, Ltd.). In this case an attempt at a test proved a failure owing to difficulties in running the plant for the length of time necessary. Arrangements were made for the staff of the Fuel Research Station to take over the plant for a few months for experimental purposes, and after certain alterations had been made tests were carried out. A full report is in preparation. (3) Fusion Corporation, Ltd. retort, installed at the works of Electro-Bleach and By-Products, Ltd., at Cledford, Cheshire. This retort is of the type that turns coal over during carbonisation, and is especially suitable for high volatile non-caking material. Using 3¾ tons of a Welbeck (Derbyshire) cannel coal, the plant worked well, the tar yield being about 54 gallons to the ton. The solid residue was practically all under ½ in. The gas yield amounted to 29.3 therms per ton, with a calorific value of 1,070 B.Th.U. per cubic ft. A full report is in course of preparation.

Constitution of Low Temperature Tars

Much work is still required on the constitution of the tars yielded by low temperature carbonisation of coal. These tars differ very considerably from ordinary high temperature tars, and their characteristics depend largely on the rate of heating of the coal, the temperatures to which the vapours of the primary products are exposed, and the time of such exposure. For these reasons "low temperature tar" is a very incomplete description, and for an investigation to be of value the exact conditions under which the tar was produced must be accurately known. This necessity has sometimes been overlooked. The study of the tars may be undertaken from two points of view: (*a*) the elucidation of the constituents in the tar, leading possibly to the identification of ingredients which, while small in quantity, may be of commercial value for purposes other than as fuels; and (*b*) the conversion in the cheapest possible way, and with the maximum yields, of the tar into motor spirit, fuel oil and, if possible, all the other products at present obtained in quantity from mineral oils. It is the second of these aspects which comes more especially within the province of the Fuel Research Division, and it has been arranged that the first mentioned shall be more intensively investigated at the Department's new Chemical Research Laboratory at Teddington. At the same time some knowledge of the constituents is essential for the study of both aspects, and no hard and fast division of work has been, or can be, made.

A still has been erected at the Fuel Research Station capable of dealing with a charge of one ton of tar at a time, and eight

charges were distilled during 1925. The study of the solubility of the tar in various organic solvents and the comparison of the crude tar with the various fractions obtained on distillation is proving of interest.

Power Alcohol

The work at the Royal Naval Cordite Factory on the production of alcohol from cellulosic materials has been continued. As regards the direct fermentation of cellulose, it may be pointed out that most vegetable matter available for the production of power alcohol consists primarily of a mixture of cellulose, hemi-cellulose, and ligno-cellulose. It is not likely that one type of micro-organism will be found, at all events in the near future, which will convert all these substances into alcohol. Attention is being concentrated on the direct fermentation of hemi-celluloses and cellulose, in the former case particularly on the direct fermentation of pentosans with a view to avoiding the utilisation of inorganic acids for their conversion into pentoses. As regards the direct fermentation of cellulose, progress has been made in the selection of pure cultures of rapidly fermenting thermophilic types. In view of the possibility of success in this direction, inquiries are being made to locate within the Empire types of organic matter containing high percentages of unlignified cellulose.

Further progress has been made in connection with the determination of the optimum conditions for hydrolysing pentosans and the fermentation of the resulting pentoses. The more important factors influencing the final results now being studied are the intervals of time for the successive adjustments of the p_H concentration and the concentration of the mash. Dried sisal pulp from Kenya and arrowroot residue (bittie) have been examined from the point of view of alcohol production.

Laboratory and Small Scale Work

The large scale work described in the report entailed considerable analytical and other laboratory work; for example, 422 proximate and 107 ultimate analyses of coal were carried out during the year, apart from special determinations of moisture, ash, or sulphur. One hundred gas analyses were carried out in the Haldane apparatus, and over 350 each with the Bone and Wheeler, and Orsat apparatus. Fifty-nine laboratory and 95 Engler distillations and 225 specific gravity determinations have been made on tars and oils. Over 700 determinations of calorific value of gases, oils, coal, or coke have been made, as well as other more or less routine tests. Work on the hydrogenation of coal, using the small high pressure bomb constructed at the station, has proceeded throughout the year with useful results. Arrangements have now been made for the supply of a small continuously working plant for the hydrogenation of coal. Arrangements have also been made for collaboration with the British Bergius Syndicate, by which the Department is kept fully informed of all the experimental work on the Bergius process which is being carried out on British coals for the Syndicate, either in Germany or in this country.

Other investigations have dealt with the carbonisation of coal in the form of fine particles; and with adsorptive agents for the recovery of spirit from coal gas, in order to determine which, if any, is more suitable than oil-washing. Activated carbon in particular has been examined from this point of view. Using active "T" carbon, the maximum recovery of benzene from coal gas would be 93 per cent. of the benzene present. In conjunction with Mr. Norman Kemp an investigation has been commenced on the examination of coals by means of X-rays, with the object of showing the distribution of mineral impurities, and also, if possible, of differentiating between the various coal constituents. Radiographs and stereo-radiographs have been prepared of blocks of coal. It is early yet to express an opinion on the utility of the method, and experiments are still in progress.

The Royal Commission on Coal, 1925

The Director was appointed an Assessor to the Royal Commission on the Coal Industry. The work involved a considerable call on the time of the Director and his staff, not only in attending meetings, but in the preparation of memoranda for the use of the Commission. Portions of these memoranda are given in appendices to the report, as the Fuel Research Board considered that they would be of general interest.

Chemistry and Coal Research

Chemical Analysis Imperative

THE work of the Lancashire and Cheshire Coal Research Association was described before the Manchester Geological and Mining Society on Tuesday by Mr. Neville Simpkin, in an address on "The Chemist in relation to the Mining Engineer." At present there are ten firms in the Coal Research Association, which employs a staff of nine chemists. Their work includes both research and general routine and control work.

Dealing with the bearing of the chemist's work upon the composition, working, and disposal of coal seams, Mr. Simpkin said that to-day the demands of various chemical and metallurgical industries as well as boiler and power houses necessitated the marketing of carefully graded products. Buyers and consumers were taking more care over what they bought; ash and moisture contents, calorific value, and so forth, were taken into account; and the coke oven manager, the gas engineer, and the chemical engineer demanded coals containing a minimum amount of sulphur, phosphorus, alkalis, and salt. Hence the colliery firm which was not interested in these matters tended to fall behind the market demands and might lose contracts as a result. In order to make such information available chemical analysis was imperative. A systematic chemical investigation of a seam would indicate the variation in ash, calorific value, sulphur, phosphorus, caking properties, melting point of ash, etc., of the different horizons of the seam. With a knowledge of these, it might in certain cases be profitable to work a seam in a different manner to obtain a purer coal for a special purpose. As an example, it frequently happened that the sulphur was not evenly distributed, and the elimination or separate filling of part of the seam might very much improve the product.

The Institute of Metals

AT the annual general meeting of the Institute of Metals, to be held in London on March 9 and 10, seventeen papers are expected to be submitted. On the evening of March 9 the annual dinner of the Institute will take place at the Trocadero Restaurant, and following the dinner a dance will be held. The annual autumn meeting of the Institute will be held at Derby in September. Arrangements for the meeting are being made under the direction of Sir Henry Fowler, of Derby. Sir Henry, who is chief mechanical engineer of the London, Midland and Scottish Railway Co., has just been appointed a Vice-President of the Institute.

The past year witnessed a steady growth in the membership of the Institute of Metals in spite of Great Britain's industrial troubles. The membership on December 31, 1926, was 1,801, as compared with 1,692. If this rate of increase is but slightly raised during 1927 the membership should reach the 2,000 mark before the Institute celebrates its 20th anniversary next year. The next election to membership is due to take place on January 19, followed by another on February 23. Particulars of the Institute, incorporated in a newly issued booklet, can be obtained by intending applicants for membership from the Secretary, Mr. G. Shaw Scott, 26, Victoria Street, London, S.W.1.

Tropical Agriculture

THE report of the Principal of the Imperial College of Tropical Agriculture, London, for 1925-26, which has just been published, contains a full summary of the work undertaken during the year. It is noteworthy that the field from which students are drawn is widening, there having been in residence during 1925-26 four students from the Union of South Africa, one from Brazil, one from Egypt, and one from Ecuador. Similarly, it is noted that already students who have passed through the college are employed in the Union of South Africa, Southern Rhodesia, Uganda, Nigeria, the Gold Coast, the Sudan, Ceylon, Barbados, Trinidad, Antigua, and British Guiana. During the year much important research work was undertaken, notably in connection with Panama Disease of bananas and the Froghopper pest of sugar canes. Experiments were conducted with the cultivation of tobacco and jute, among other crops, and it is recorded that half an acre yielded over 500 lb. of cured leaf tobacco, which realised 3s. per lb., but development work in this connection is hampered through lack of curing facilities.

Standardisation in Chemical Analysis

Dangers to be Avoided

A MEETING of the Manchester Section of the Society of Chemical Industry was held on Friday, January 7, Mr. L. Guy Radcliffe, M.Sc.Tech., F.I.C., presiding. Four papers were read and discussed.

A paper on "Standardisation in Chemical Analysis" was read by Professor W. H. Roberts, of Liverpool. He did not, he said, believe in standardisation as a general principle, but only in such special cases as the "Reichert-Wollny" process for the determination of butter fat. A process of that description should be absolutely standardised. It was not possible to standardise either the accuracy or the temperament of the workers using a process. It was also very difficult to get anybody to carry out literally a standard process as laid down; sooner or later a man would vary the process to suit himself, and even slight differences would create great variations in the final results. Several processes had been more or less standardised, and for these standard apparatus had been set up. One, in particular, was the method of determining the strength of alcoholic liquid by means of the "Sikes" hydrometer, yet there were probably very few outside the laboratories of analysts which were accurate. Fortunately, they nearly always read the alcoholic strength too low, which was to the benefit of the consumer. Certain other standardised instruments devised for the same purpose gave different results in the hands of different workers. In the case of one particular instrument, he had known of a variation of as much as 5 per cent. of proof spirit with exactly the same alcoholic liquid.

It was practically impossible to adopt any standard method for any particular substance. For standard processes there must be standard apparatus, and that apparatus must be very carefully and accurately checked, and in most laboratories this was not the case. Standard processes as laid down by text books did not conduce to concordant results on the part of different workers, while, if all tests and all analyses were done by standard methods, then the thinking part of the chemical profession would very rapidly deteriorate.

Professor Roberts stated that, in his opinion, it was the duty of every analyst to work out his own processes; to test everything for himself and not to rely implicitly upon anybody's statement in a text book.

Normal Amylbenzene and Some of Its Derivatives

In a paper on this subject by L. G. Radcliffe, M.Sc.Tech., F.I.C., and R. L. F. Robert, M.Sc.Tech., A.I.C., the authors stated that they had repeated, improved, and extended the work described by one of them and N. Simpkin in a previous communication. As before, the starting material was normal butyl alcohol which, using Fittig's reaction and purified benzyl chloride, gave a considerable quantity of normal amyl benzene. Since the previous publication, the yield of normal amyl benzene had been materially improved by the use of mechanical stirring of the reaction mixture instead of shaking, and the whole process instead of occupying several days had been shortened to six or eight hours. From the hydrocarbon the *p*-sulphonic acid, the sulphonamide, the *p*-hydroxy compound, and various other derivatives had been prepared.

In a paper on "The Estimation of Mixtures of the Isomeric Toluidines," H. H. Evers, B.Sc., Ph.D., and N. Strafford, M.Sc., A.I.C., stated that numerous methods had been advanced for the estimation of *p*-toluidine in samples of *o*-toluidine, but in all of them the influence of the meta-isomer—which was invariably present in small amount in technical toluidines—was overlooked, and for this reason alone, the accuracy of some of the methods was rendered doubtful. All the methods reviewed in the paper were found to be of limited value, whilst it was claimed that the methods proposed by the present authors permitted of an accurate determination of both meta and para isomers. The estimation of the meta-toluidine depended upon the fact that on titration with standard bromate (cf. Callan and Henderson, J.S.C.I., 1922, p. 161T) this isomer absorbed 3 atoms of bromine per molecule, whilst each of the others absorbed only 2 atoms per molecule, hence the proportion of meta could readily be calculated. For the determination of *p*-toluidine, a thermo-analytical method had been evolved. Since *o*-toluidine remained liquid, even at −20° C., a direct setting point method could not conveniently be applied when dealing with samples of low para content; the difficulty had been overcome by artificially raising the setting-point by the addition of pure *p*-toluidine in known amount.

The fourth paper read dealt with the influence of the sulphur atom on the reactivity of adjacent atoms or groups, and indicated a qualitative comparison of the reactivities of chlorine and hydroxyl in the α, β, γ, and δ positions to a sulphur atom. The authors of the paper were Messrs. G. M. Bennett, M.A., Ph.D., and A. L. Hock.

Institution of Chemical Engineers

Activities in 1926

THE following notes on the work of the year 1926 should have appeared in our Annual Review Number, but unfortunately went astray:—

The past year has seen a considerable augmentation of the activities of the Institution. The membership has increased by about 30 per cent. during the year. The most important feature of the year's work is undoubtedly the holding of the first examination for the Associate-membership diploma of the Institution. The examination was organised on somewhat novel lines and was deliberately arranged to test the candidates as regards not only their knowledge, but also their capability of applying such knowledge to new problems. The first paper was set to be worked at home during a period of about five weeks, and the questions were mainly concerned with design and commercial exploitation. In this paper two questions only out of eight had to be answered, and recourse to reference books was permitted. In this, as in all subsequent papers, the examiners allowed little credit for a correct answer where the method of attack and any necessary calculations were not given. Subsequently, the candidates attended in London for four papers worked under normal conditions, each paper containing ten questions of which four might be attempted. The candidates were then entertained to dinner by the Board of Examiners, after which a *viva voce* session was held. Six candidates entered, a satisfactory number for an examination of the scope of which no previous guide existed. Of these candidates one was successful, and the Board of Examiners, in their report to the Council, stated that the examination had disclosed the urgent need of further educational facilities being provided in chemical engineering. The matter is being pursued by the Education Committee of the Institution, and it is hoped that the review of 1927 will enable a record to be made of a distinct advance in this connection in more than one centre.

The part played by the Institution in the organisation of the Congress of Chemists in July last was one of considerable importance, for not only were arrangements made for two sessions of the conference and a steamer trip, but, in addition, the whole office organisation was placed at the disposal of the executive committee. The annual corporate meeting and the annual dinner were respectively the first business and social functions of the Congress.

A reception was held in October to usher in the 1926/27 session, when the President, Sir Frederic Nathan, K.B.E., received some 300 members of the Institution and friends at the Gallery of the Royal Society of Painters in Water Colours.

Consideration has been given at meetings of the Institution to problems arising in filtration, grinding, and (in conjunction with the Chemical Engineering Group of the Society of Chemical Industry) the beet sugar industry. A further innovation in the programme of the Institution was introduced in December, when a conference was held, extending over three days. Among the subjects on which papers were read were:—"The Measurement of Mechanical Power Absorbed by Driven Machines"; "The Control of Chemical Plant Operation by Statistical Methods"; "Statistics in Industry—Some Uses and Limitations"; "Air Elutriation: Refrigeration."

During the year an invitation was received from the American Institute of Chemical Engineers for a joint meeting to be held in the United States in 1928. This invitation has been accepted by the Council, and the programme is now being worked out by the American hosts.

Display of Scientific Apparatus

Exhibitors at the Physical and Optical Societies' Exhibition

AT the exhibition of apparatus held last week by the Physical Society and the Optical Society, at the Imperial College of Science and Technology, London, a number of exhibits of great interest to chemists were shown. Among the exhibitors were the following :—

Charles Baker (microscopes, telescopes, etc.); R. and J. Beck, Ltd. (microscopes, spectroscopes, polarimeters, etc.); Bellingham and Stanley, Ltd. (spectrographs, saccharimeters, spectrometers, photometers, refractometers); Cambridge Instrument Co., Ltd. (dissolved oxygen recorder, carbon dioxide indicator, surface pyrometer, disappearing filament pyrometer, a glass electrode potentiometer of a new type, surface tension apparatus, etc.); R. M. Catterson-Smith and K. S. Mills (electric resistance laboratory furnace and other furnaces); The Damard Lacquer Co., Ltd. ("Formite" Bakelite synthetic resin products, including resins, cements, insulating varnishes, moulding powders, and "Damarda" acid resisting lacquers); W. Edwards and Co. (vacuum pumps, of the rotary oil, mercury vapour, Gaede, and other types, and apparatus for high vacuum work); Electroflo Meters Co., Ltd. (fluid-flow metering and temperature measuring and recording instruments, including an Electroflo—electrically operated—meter, a new type of duplex continuous electric temperature recorder, and a distance indicating pyrometer); Foster Instrument Co. (automatic temperature control apparatus, sparking plug thermo-couple pyrometer, strip recorder, optical, radiation and indicating and recording pyrometers; distance thermometers, etc.).

A. Gallenkamp and Co., Ltd. (electric furnaces and electrically heated ovens, electro-titration apparatus, petroleum testing apparatus, colorimeters, electric heaters and temperature regulators for thermostat baths, motor driven air and vacuum pumps); J. J. Griffin and Sons, Ltd., and Baird and Tatlock, Ltd. (an experimental model of the Boys recording and integrating gas calorimeter; carbon dioxide indicators, thermo-electric pyrometers, laboratory electric furnaces and ovens, water ovens, oil testing apparatus); Adam Hilger, Ltd. (Guild trichromatic colorimeter, spectrographic apparatus, visual spectroscopic apparatus, polarimeters, X-ray spectrographs); Isenthal and Co., Ltd. (water level indicating and gas pressure recording instruments); Kelvin, Bottomley and Baird (daylight lamps); George Kent, Ltd. (ventilation manometers and rotary steam meters); P. J. Kipp and Zonen (spectrographs, radiation pyrometers, etc.); Negretti and Zambra (mercury in steel dial and recording thermometers; electrical resistance, thermo-couple, and mercury in glass thermometers).

Baird and Tatlock (London), Ltd. (electrometric titration apparatus, Metro gas circulator); L. Oertling, Ltd. (balances of all types, hydrometers, saccharometers); Ogilvie and Co. (microscopes, epidiascopes, colorimeters, and other optical apparatus); Siemens Brothers and Co., Ltd. (pyrometers, thermometers, and temperature recorders); James Swift and Son, Ltd. (microscopes of all types); The Tintometer, Ltd. (Lovibond's Tintometer, etc.); W. Watson and Sons, Ltd. (microscopes and optical apparatus); Carl Zeiss (London), Ltd. (microscopes, refractometers, polarimeters, spectroscopes).

Dr. G. D. Bengough and Mr. J. M. Stuart exhibited articles illustrating their work on the protection and colouring of aluminium and duralumin apparatus, and the Brown-Firth Research Laboratories showed the development of the iron-chromium and the iron-chromium-nickel non-corrodible steels.

Testing of Transformer Oils

WE have received a copy of a brochure entitled "Studien über die Prüfung der Transformatorenöle" (Studies on the Testing of Transformer Oils) (pp. 39, 2 Marks 50), published by the Deutscher Verband für die Materialprüfungen der Technik. The volume contains 10 papers on the chemistry and physics of transformer and insulating oils, etc., by a number of German authorities, including several contributions from the chemical laboratories of the A.-G. Brown, Boverie and Co. in Baden, and the A.E.G. transformer factory in Berlin. Copies may be obtained from the publishers above-mentioned, at D.V. Materialprüfung, Berlin N.W.7, Germany.

Year Books and Calendars for 1927

The Silk and Rayon Directory and Buyers' Guild of Great Britain (John Heywood, Ltd., 21s.) is a very complete compilation of historical, technical, and commercial information concerning the industry. Its growth indicates the pace at which artificial silk manufacture continues to expand, and the directory appears to have been successful in keeping pace with the advance.

Doughty-Richardson Fertilisers, Ltd., Carholme Road, Lincoln, issue a farmers' pocket diary for 1927, which is attractively bound as a pocket book, and constitutes a very useful manual of information for all engaged in agriculture.

The Textile Recorder Year Book, 1927 (John Heywood, 7s. 6d.) consists of close on 1,100 pages, a fact which in itself indicates its comprehensive character. It is a sort of Bible to the textile industry, and it would be difficult to mention any matter of importance not covered in some way in this remarkable handbook.

The Colour Users' Association's Vade Mecum for 1926-27 contains, in addition to much information about the Association, notes on the Dyestuffs (Import Regulations) Act, 1920, on the procedure under the Act, on the Dyestuffs Industry Development Committee; a list of British Dyestuff manufacturers; statistics of dyestuff production here and abroad; various tables of technical data; and other valuable information.

Whitaker's Almanack for 1927 gives an account of the "astronomical and other phenomena and a vast amount of information respecting the government, finances, population, commerce, and general statistics of the various nations of the world." Among the topics noted in the table of contents are education statistics, universities and schools, societies and institutions, weights and measures, wages and other tables, the British Empire (a very complete account with statistics), the Dominions, annual summaries (events of the year, obituaries, science and invention, etc.). The "Almanack" remains one of the most informative books of general information in existence. The complete edition costs 7s. 6d., and there is an abridged edition (paper covers) at 1s. 6d. The publishers are J. Whitaker and Sons, Ltd., of 12, Warwick Lane, London, E.C.4.

The South American Handbook, 1927, published by South America Publications, Ltd., of Atlantic House, Moorgate, London (pp. 645, 2s. 6d.), gives a vast amount of information of a very important area. There are sections dealing with countries and towns from every possible point of view, and details are given in regard to every aspect of commercial activity. There is a comprehensive account of the products of South America, and of steamship, railway, and banking facilities. An unusual and attractive feature is a list (with notes) of books dealing with South America, ranging from the works of James Bryce and W. H. Hudson to the series of works on South America published by T. Fisher Unwin, Ltd.

Activity in Otto Plants

INDUSTRIAL activity in Germany has been marked during the past year, and great progress has been made in the direction of large chamber regenerative ovens and by-product plants. One firm, Dr. C. Otto and Co., of Dahlhausen-on-Ruhr, has booked during the last few months no fewer than five extensive plants in Germany and one in Russia with a total of 310 ovens.

The Otto Co. have had installed for some time past a demonstration plant, consisting of five full-sized ovens, combination type, with complete by-product plant at their works at Dahlhausen. This plant is working continuously under the direction of experienced engineers and chemists, and remarkable results are said to have been obtained in coking speed and large output of high quality uniform coke. These results in the main have been obtained through the heating of the coke oven walls being absolutely under control, and the evenness of the temperatures. The company, we understand, are prepared to undertake complete coking tests, free of cost, and on a large scale, for any British undertaking raising coking coal.

In this connection the Otto Co. have affiliated themselves with Silica Coke Oven and Machinery, Ltd., Aldwych House, Aldwych, London, W.C.2, from whom further particulars may be obtained.

Imperial Chemical Industries, Ltd.

The Policy of a Bold Front

SIR ALFRED MOND, chairman of Imperial Chemical Industries, in an introduction to a collected volume of articles dealing with various activities and interests of that company, says:

The four constituent companies—Brunner, Mond and Co., Nobel Industries, United Alkali Co., and British Dyestuffs Corporation—after very careful consideration, came to the conclusion that the time had arrived for the British and Imperial chemical industry to endeavour to form equally a united front.

The constituent companies operate not only in this country, but throughout the Empire and the markets of the world. They were already related not only as producers, but also as consumers of each others' products. The great advantage to be gained from as close and intimate a relationship as it was possible to create was therefore felt by all concerned.

The formation of Imperial Chemical Industries will enable the British chemical industry to deal with similar large groups in other countries on terms of equality. It will enable the industry to speak with a united voice. Instead of leaving it to individual units to make arrangements for the world's competitive conditions as best they can, Imperial Chemical Industries will give them all the authority, prestige, and advantages of a great combination.

To-day capital expenditure on modern chemical plant runs into many millions of pounds. Specialisation of products, the most efficient use of capital and of technical processes therefore become a vital factor to success, not only in the chemical industry, but throughout all modern indutries.

Not Monopoly, but Efficiency

Modern mergers when managed by able business men are not made for the purpose of creating monopolies or of inflating prices. Fusions are formed for the purpose of realising the best economic results which both capital and labour will share to the best advantage. They enable varieties of industries to form an insurance against fluctuations of markets and prices in individual products. In fact, both for the shareholder and the worker, fusion acts as a form of insurance against those risks in industry which are inherent and cannot be avoided, even by the most skilful management.

In past days Great Britain has produced as large a body of courageous and scientific inventors in the realm of chemical industries as any other country, if not a larger. A combination such as has been formed, having at its command capital, management, and research to enable it to finance, develop, and explore all the new potentialities, should be in a position second to none to keep the country and the Empire in the first and foremost rank of an industry which is essential for the national safety and fundamentally the basis of a vast superstructure of other industries depending upon its products. For chemicals form the foundation of industries.

Co-partnership

The relationship between the co-partners in the chemical industry has had a fortunate and happy history. Those who in the past have conducted the industry have always regarded all those working with them in any capacity as fellow-workers in a common cause. The foundation of Imperial Chemical Industries will not alter that close personal contact which has happily existed for more than one generation between the captains and their companies of men. The good-will of all those engaged in the industry is one of the most valuable of invisible assets, and this is fully recognised by those who will control the future destiny of the chemical industry of Britain and the Empire.

Consulting Chemist's Suicide

SUFFERING from a delusion that his brain was wasting away, George Gwynne (53), of Bridge Road, Epsom, a retired consulting chemist, was found gassed at his home. At the inquest, held by Mr. G. Wills Taylor (coroner), on Saturday, January 1, Mrs. Gwynne said her husband walked about at nights, and once told her he did not want to live. A doctor advised her that his conduct was "absolutely theatrical." She thought that he ought to have been taken to a nursing home. A verdict of "Suicide whilst of unsound mind" was returned.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

7. "I should esteem it a favour if you could enlighten me as to what firms manufacture 'Alumino-Silicates of Soda.' I refer to the unstable compounds, which hydrolyse on addition to water, yielding colloidal silica and aluminium hydroxide. Could you indicate (or reference) the method of manufacture of these alumino-silicates of soda?"

8. "Can you inform us of the manufacturers and suppliers of aluminoferric cake?"

9. "We should be greatly obliged if you could advise us who are the manufacturers of mineralising liquid for treating sawdust to be used in concrete."

10. "We occasionally have inquiries from clients abroad for plant for the making of wood charcoal and by-products. At the present time we have such an inquiry from one of our Colonies for a complete plant, including the manufacture of wood charcoal, with the recovery of methyl alcohol, methyl acetone, light and heavy oils and tar. We shall be much obliged if you can give us the names of one or two makers of such plant, as we should like to get into touch with them on the matter."

11. "We should be extremely obliged if you could give us the name of a good firm who manufacture plant for making seaweeds into potash, iodine, acetone, and other products."

12. "Could you put us in touch with manufacturers of calcium carbide in the United Kingdom and Ireland, not bound to the Syndicate?"

13. An inquiry has been received for information as to the possibility of developing a market in this country for lithium salts. Our inquirer is interested in this matter, because very large deposits of such salts have been found recently. As far as our inquirer has been able to ascertain up to the present, lithium compounds have been only very slightly used, owing to their high price, but it is thought that possibly if large supplies were available at low prices, such salts might be suitable for use on a commercial scale in various industries.

Replies

6. (Zinc Chloride plants, January 8, 1927.) Generally speaking, the installation of a zinc chloride plant would be the duty of the resident works chemist, and not many firms specialise in their supply, although many manufacture the necessary vats and other apparatus. A chemical engineer who has recently designed zinc chloride plants for a distant part of the Empire, is willing to prepare a design for any English works on being informed of the particulars. One or two firms announce their willingness to supply the plant.

Useful Products from Refuse

GREAT interest is being taken in Germany in a new process for the industrial utilisation of street refuse. The inventor is a Berlin engineer, Dr. Kurt Gerson. Berlin intends, it is stated, to employ the new process instead of the present method of incineration. Briefly, the refuse is first placed on mechanical sieves, which separate the fine from the coarse, and powerful electric magnets withdraw all metallic substances. Transporters carry the material farther, and substances like glass and bone are withdrawn for separate treatment. The remaining mass is passed through pneumatic cleansers and subjected to special processes from which a fibre is obtained. From this cardboard and paper can be made. Mixed with cement, it yields tiles and cheap insulation blocks, etc. Another product is a cheap fuel, while a different treatment gives dynamite and artificial silk, and a third a valuable artificial manure.

Pharmaceutical "Analysts"

WE have received an interesting letter from a consulting chemist and analyst in reply to that of Mr. Cofman-Nicoresti, but the apparently inadvertent omission of the signature prevents us from publishing it.

From Week to Week

RECENT WILLS INCLUDE: Mr. Mark Singleton, of Leeds, late of Singleton Bros., dyers, of Morley (net personalty £17,474), £22,449.

MR. E. MATTHEWS has been appointed demonstrator in chemistry in the chemical department of Guy's Hospital Medical School, London.

THE BRITISH ROAD TAR ASSOCIATION, of Victoria Station House, S.W.1, announce that their address has been changed to 17, Grosvenor Gardens, London, S.W.1. Telephone: "Victoria, 7709."

MR. J. W. TURCAN, of the firm of Charles J. Turcan and Co., of Leith, has been appointed a director of the North British Rubber Co., in succession to the late Sir James Howard Warrack, K.B.E.

MR. A. CHASTON CHAPMAN, F.R.S., has consented to give a lecture before the Institute of Chemistry in March, dealing with the general progress of the chemical profession during the past fifty years.

MONEL METAL has been successfully applied by the Talbot-Stead Tube Co., Ltd., of Walsall, to the manufacture of non-corrosive marine condenser tubes. The Admiralty has placed an order for these tubes for use in a cruiser.

FAWCETT, PRESTON AND CO., LTD., sugar machinery manufacturing engineers, of Liverpool, have received the contract for the erection of the beet sugar factory at King's Lynn, to deal with 1,200 tons of beet per day.

The Manufacturer's Record, of Baltimore, refers to Dr. Charles H. Herty, of New York, a well-known figure in American chemistry, as "one of the great industrial leaders who would be worthy of nomination as President of the United States."

MR. J. C. BRIDGE, F.R.C.S. (Ed.), one of the medical inspectors of the factory department, has been appointed by the Home Secretary to the post of Senior Medical Inspector of Factories, which was vacated by the resignation of Sir Thomas Legge.

PROFESSOR R. WILLSTATTER, the eminent organic chemist, has declined a request to accept the chair of chemistry in the University of Leipzig, vacant on the retirement of Professor A. Hautzsch. Professor Willstätter at present occupies the chair of chemistry at Munich.

THOMAS BROADBENT AND SONS, LTD., of Central Ironworks, Huddersfield, engineers and manufacturers of centrifugals, etc., inform us that they have opened an office at 65, Bath Street, Glasgow, under the management of Mr. Eden Field. The Glasgow office has the telephone number Douglas 2459; telegraphic address, "Broadbent, Glasgow."

A CATALOGUE of wholesale prices current, dated January, 1927, has been issued by Thomas Tyrer and Co., Ltd., of Stirling Chemical Works, Stratford, London, E.15, manufacturers of "Sterling" brand chemicals. The catalogue comprises a very large number of products, both ordinary and B.P., pharmaceuticals, solutions of chemicals, A.R. chemicals, acids, etc.

THE INTERNATIONAL RUBBER EXHIBITION will be held in Paris from January 21 to February 6. Among the papers to be read are the following: "New Methods and Modifications of Rubber Preparations," by Dr. H. P. Stevens; "Some Technical Problems of the Rubber Industry," by Dr. S. Pickles and Mr. B. D. Porritt; "The Stabilisation of Vulcanised Rubber," by Dr. P. Schidrowitz.

THE PROGRESS MEDAL of the Royal Photographic Society of Great Britain, which is regarded as the world's highest photographic honour, has been awarded to Mr. George Eastman, the founder and president of the Kodak Company. The award has been made in recognition of Mr. Eastman's "inventions, researches, publications, and other works which have resulted in an important advance in the development of photography."

THE ROCK INVESTMENT CO., LTD., have purchased the Branstone factory of Crosse and Blackwell, for the manufacture of artificial silk. The factory was built during the war for the manufacture of machine guns, but the armistice came before it was available for this purpose, when Crosse and Blackwell purchased it for use as a potted meat paste factory. The machinery will cost £400,000, and about 2,000 hands will be employed.

THE ARMOURERS AND BRAZIERS COMPANY announce that the company has, in conjunction with the Master Cutler of Sheffield and representatives of the Sheffield industries, endowed a scheme for the benefit of technical workers of Sheffield. The object is to encourage members of trade societies to take a keener interest in their work and to discover improved methods. The endowment is to consist of £150 to be given annually by the company during their pleasure.

SULPHUR MONOCHLORIDE escaping from a hundredweight container in Tooley Street, London, had to be dealt with by firemen wearing gas masks.

Die Chemische Industrie, the organ of the Union for the Support of German Chemical Industry, reached its jubilee in the copy issued on January 8.

DR. L. DUDLEY STAMP read a paper on "The Conditions Governing the Occurrence of Oil in Burma" before the Institution of Petroleum Technologists on Tuesday.

A CHEMICAL FIRE ENGINE, costing £1,500, is to be purchased for the Plymouth fire brigade, following their experiences at a recent fire in close vicinity to storage tanks containing 22,000 gallons of petroleum.

THE UNITED ANTHRACITE COLLIERIES, LTD., have issued a circular to their shareholders stating that the meeting to approve the fusion with Amalgamated Anthracite Collieries will take place at the end of January.

SIR ERNEST RUTHERFORD, president of the Royal Society and professor of physics in the University of Cambridge, has been awarded a prize of $1,000 by the Sigma XI National Scientific Honor Fraternity of America.

THE MOUNT LYELL MINING AND RAILWAY CO. are erecting works near Sydney, New South Wales, for the manufacture of caustic soda and chlorine. The company also have chemical works at Yarraville, Victoria, and Fremantle, Western Australia.

REDRUTH LITERARY INSTITUTION has received gifts of copies of *Watt's Dictionary of Chemistry* (nine volumes) and Rickard's *Miners' Manual*, which have been presented to the Institution by Mr. Alfred James, consulting mining engineer, Victoria Street, London.

MR. J. A. BRIGGS, of the firm of William Briggs and Sons, Ltd., chemical manufacturers and contractors, of Dundee, has just returned from a visit to the United States. In an interview he gave an account of the present trade boom there, and analysed the factors leading to it.

MR. S. S. NAPPER, F.I.C., A.C.G.I., has been appointed a director of British Visada, Ltd. Mr. Napper was employed by Courtaulds, Ltd., for 18 years as chief works and research chemist in artificial silk manufacture, and will act as consultant chemist to the company in addition to acting as a director.

MESSRS. H. H. BASS AND G. G. BARNARD arrived in Australia recently from Scotland on their way to Plane Creek, near Mackay, to conduct research work for a company formed to produce power alcohol, which is to be manufactured in Queensland from molasses, cassava, and, it is hoped, from prickly pear.

THE ANGLO-SCOTTISH BEET SUGAR CORPORATION, LTD., have erected a beet sugar factory at Poppleton, near Leeds, which was opened on Friday, January 7, by Lady Invernain, wife of Lord Invernain, one of the directors. Duncan Stewart and Co., of Glasgow, are the engineers who have constructed the Poppleton and other factories of the "Anglo-Scottish" group.

A NON-INFLAMMABLE FILM, which its promoters claim will obviate the danger of fire and panics in cinema theatres, and as a consequence render unnecessary the very stringent regulations at present enforced by the authorities, was demonstrated at the Tivoli Theatre, Strand, London, on Tuesday, before an audience present at the invitation of Sir Herbert Blain, chairman of the Non-Inflammable Film Co.

Obituary

MR. GEORGE MEGGITT, aged 65, of Newport, formerly chief engineer to Morris and Griffin's chemical works at Newport.

MR. FREDERICK W. HOWELL, of Hawkskaw, near Bury, a director of the Bleachers' Association, and assistant managing director of James Howell and Co., Ltd.

MR. EDWARD JAMES WOOLLEY, chairman of James Woolley, Sons and Co., Ltd., manufacturing and wholesale chemists, of Manchester, on January 8, at Bowdon, Cheshire.

DR. F. J. MOORE, ex-professor of inorganic chemistry in the Massachusetts Institute of Technology, on November 20, 1926, aged 59. He retired from the professorship about a year ago, owing to ill-health.

PROFESSOR LEOPOLD SPIEGEL, of the University of Berlin, on January 3, aged 61. He had published much research on the alkaloids, was the discoverer of yohimbine, and had written a number of books on chemistry and pharmacology. He was on the editorial staff of the *Chemische Centralblatt* for many years.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

262,364. KETEN, PRODUCTION OF. H. Dreyfus, 8, Waterloo Place, London, S.W.1. Application date, June 13, 1925.

The object is to obtain keten from mixtures containing hydrogen and carbon monoxide by the action of heat and pressure in the presence of catalysts. The carbon monoxide and hydrogen are employed in about the theoretical proportion, namely, three molecules of carbon monoxide to one molecule of hydrogen. The catalysts employed are those used in the synthesis of methyl alcohol or other oxygenated compounds, such as zinc oxide, copper oxide, copper chromate, zinc chromate, zinc aluminate, potassium zincate; zinc oxide with potassium acetate or potassium carbonate; zinc oxide with aluminium; copper, zinc, or tin with potassium carbonate, sodium carbonate, or the acetates; or caustic alkali with zinc oxide or copper oxide. The temperature is preferably 200° to 300° C., and the pressure up to 200 atmospheres or more. Catalysts which favour the production of methane are avoided, and the speed at which the gas is passed through the apparatus must be sufficiently high to avoid the production of hydrocarbons and higher alcohols. The product containing keten can be used directly for the production of acetic acid or anhydride.

262,494. METHYL ALCOHOL, MANUFACTURE OF. H. Dreyfus, 8, Waterloo Place, London, S.W.1. Application date, June 13, 1925.

It is known that when hydrogen and carbon monoxide are combined at high temperatures and pressures in the presence of catalysts, the conditions of working may be modified so as to produce particular organic compounds as main products. It has been found that in the production of methyl alcohol it is not necessary to have an excess of hydrogen, but that the proportion usually present in water gas may be used if zinc oxide alone is used as the catalyst. The proportion of hydrogen may be one molecule or less to each molecule of carbon monoxide. The temperature is preferably 200° to 300° C., and the pressure 50 to 150 atmospheres. Reference is directed in pursuance of Section 7, Sub-section 4 of the Patents and Designs Acts of 1907 and 1919 to Specification No. 20,488/1913.

262,537. FAST DYEINGS ON THE FIBRE, PROCESS FOR PRODUCING. A. G. Bloxam, London. From Akt.-Ges. für Anilin Fabrikation, Treptow, Berlin. Application date, September 17, 1925.

These dyeings are produced by impregnating the fibres with a compound adapted to couple and with a nitrite, and then treating the fibre in a separate bath with an acid or an acid salt in the presence of a diazotisable amine which is either a constituent of the bath or has been introduced into the fibre by impregnation before treatment in the acid bath. Goods may be printed with a thickened mixture of both components and a nitrite, and then dried, and the dyestuff developed by the action of an acid or an acid salt. In the case of cellulose acetate fibres, the material is treated at a raised temperature with a solution or suspension of both components and a nitrite together with turkey-red oil or a soap. In an example, cotton is treated with a solution containing the anilide of 2-oxynaphthalene-3-carboxylic acid, sodium hydroxide, turkey red oil, formaldehyde and sodium nitrite. The cotton is then treated with a solution containing the hydrochloride of 2-chlordianiline and aluminium sulphate. A large number of other examples are given.

262,552. COPPER SILICATE ORES OR PRODUCTS, TREATMENT OF. W. Dewar, 24, Finsbury Square, London, E.C.2. Application date, October 6, 1925.

The process is for treating copper silicate ores or products in which the copper is present in varying states of chemical combination which required complex treatment. Such ores have been heated in a reducing atmosphere to 400° to 700° C., with or without carbonaceous material to reduce the copper to the metal, and then leached with an ammoniacal solution in the presence of air. In this invention the copper is reduced only to the oxide by regulating the temperature during the preliminary heating, and by maintaining an atmosphere of producer gas or the like in the furnace. The current of air during leaching is dispensed with. The ore, which may contain copper carbonate, oxide, and silicate, or silicate alone, is heated in the presence of producer gas to 190° to 230° C., or it may be heated in air or other neutral atmosphere to 500° to 550° C. It is found that a lower temperature does not produce the oxide in a soluble form, while at a higher temperature the quantity of copper converted is less.

262,832. ACETIC ACID, MANUFACTURE OF. H. Dreyfus, 8, Waterloo Place, London, S.W.1. Application date, June 13, 1925.

The process is for producing acetic acid from a mixture of hydrogen and carbon monoxide in approximately equimolecular proportions by the employment of particular catalysts and particular conditions of temperature and pressure. The catalysts are those which are, or are capable of forming, acetates which decompose with the formation of acetic acid at temperatures between 200° and 300° C. These substances may be used alone if they are capable of combining carbon monoxide and hydrogen, or if not they may be associated with catalysts of the kind employed in the synthesis of methyl alcohol and other oxygenated organic compounds. Catalysts which favour the production of methane are not used. Suitable catalysts include copper oxide, tin oxide, lead oxide, copper acetate, aluminium methylate, tin methylate, or mixtures of these with or without more basic materials such as sodium or potassium acetate. The pressure may be up to 200 atmospheres, preferably 50 to 150 atmospheres.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 238,566 (Soc. des Etablissements Barbet), relating to rectification of acetic acid, see Vol. XIII, p. 427; 249,465 (Consortium für Nassmetallurgie), relating to purification of plumbiferous chloride liquors, see Vol. XIV, p. 527; 251,932 (Vulcan Detinning Co.), relating to separation of arsenic and tin, see Vol. XV, p. 88; 252,693 (Höganas Billesholms Aktiebolag), relating to production of aluminium oxide, see Vol. XV, p. 164; 253,875 (New Jersey Zinc Co.), relating to zinc oxide, see Vol. XV, p. 210.

International Specifications not yet Accepted

260,940. DYES. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, und Brüning, Hoechst-on-Main, Germany.) International Convention date, November 7, 1925. Addition to 251,996. (See THE CHEMICAL AGE, Vol. XV, p. 88.)

The thioindigoid dyes described in Specification 251,996, *e.g.*, 4-methyl-5 : 6-dichlorthionaphthene-2 : 2′-dichlorindol-indigo, are further halogenated. The shade becomes bluer, and the fastness to kier-boiling is increased.

260,969. CARBON BISULPHIDE. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Chemische Fabrik-Griesheim-Elektron, 31, Gutleutstrasse, Frankfort-on-Main, Germany.) International Convention date, November 3, 1925. Addition to 174,040. (See THE CHEMICAL AGE, Vol. VI, p. 353.)

The bottom of the electrical shaft furnace employed is constructed as a sump, so that the slag collects and forms a good contact between the electrode and the charge of charcoal. The heat contained in the slag ensures the volatilisation of the sulphur which flows on to it.

260,998. DYES. L. Cassella and Co., Ges., Frankfort-on-Main, Germany. International Convention date, November 7, 1925.

Anthanthrone is treated with halogenating agents such as chlorine in nitrobenzene or trichlorbenzene, chlorine in

sulphuryl chloride in presence of iodine, chlorine or bromine vapour in presence of iodine or ferric chloride, bromine in sulphuric acid or oleum and in presence of iodine, bromine in nitrobenzene or chlorinated benzene with or without iodine or antimony pentachloride, excess of liquid bromine with or without iodine. The halogen derivatives dye cotton from the vat in orange shades.

261,026. ORGANO ARSENIC COMPOUNDS. E. Scheller, Lorsbach, Taunus, Germany. International Convention date, November 9, 1925.

These compounds are obtained by treating carbocyclic or heterocyclic diazo compounds with arsenic halides and decomposing the addition product with water. Copper or its compounds may be present as catalysts. In an example, a mixture of α-oxy-β¹-aminopyridine hydrochloride, glacial acetic acid, arsenic trichloride, and a little cuprous chloride is heated with strong sodium nitrite solution. The solvent is distilled off, and the residue treated with water and sodium hydrosulphite, yielding α-oxy-β¹-pyridine-arsinic acid. Some other examples are given.

261,029. CONDENSATION PRODUCTS FROM DIMETHYLOL-UREA, ETC. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, November 7, 1925. Addition to 260,253. (See THE CHEMICAL AGE, Vol. XVI, p. 29.)

The urea and formaldehyde employed in the process of specification 260,253 are replaced by dimethylol-urea, which is obtained by the action of formaldehyde on urea in alkaline or neutral aqueous solution at ordinary temperature. Solvents such as methyl or ethyl alcohol, acetone, or a phenol may be employed. Instead of dimethylol-urea, products of higher molecular weight obtained by splitting off water, or analogous compounds from other aldehydes, and urea or its derivatives may be used. In one example, a solution of dimethylol-urea in hot ethyl alcohol is condensed by adding hydrochloric acid. Sodium acetate is added, and the alcohol evaporated and the product heated to obtain a hard transparent substance. By employing glycol monoethyl ether in place of ethyl alcohol, and neutralising the condensation product with sodium bicarbonate, a colourless lacquer is obtained.

261,039. CLEANSING COMPOSITIONS, MOTOR SPIRIT, ETC. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, November 9, 1925.

Coal, tar, mineral oils, or other carbonaceous materials are destructively hydrogenated, and the liquid hydrocarbons obtained are used as solvents or distributing agents. Thus, a motor spirit is obtained by mixing a benzene obtained from lignite tar with methanol in any proportion. Homogeneous mixtures of this benzene with ethyl alcohol containing up to 84 per cent. of benzene are used for dry cleaning, for dissolving rubber, and in the manufacture of lacquers, boot and floor polishes, soaps, cleansing compositions, etc.

261,048. GOLD DOUBLE THIOSULPHATES. Dansk Chemo-Therapeutisk Selskab Ved Andersen, Siesbye, and Weitzmann, Denmark. International Convention date, November 7, 1925.

Aurous bromide or iodide is dissolved in the bromide or iodide of an alkali or alkaline earth metal or ammonium, and the calculated quantity of thiosulphate is added, alcohol being present in the solution. The double thiosulphate is precipitated by adding alcohol.

LATEST NOTIFICATIONS.

263,483. Process for the activation of silicic acid gel. I. G. Farbenindustrie Akt.-Ges. December 22, 1925.

263,494. Manufacture and production of vat dyestuffs of the anthraquinone series. I. G. Farbenindustrie Akt.Ges. December 22, 1925.

263,755. Method of increasing the strength or hardness at elevated temperatures of magnesium or magnesium alloys. I. G. Farbenindustrie Akt.-Ges. December 24, 1925.

263,756. Mounting for furnace electrodes. I. G. Farbenindustrie Akt.-Ges. December 28, 1925.

263,773. Process for the manufacture of alkyl and aralkyl derivatives of cyclo-trimethylene-aryl-pyrazolones. Mannich, C. December 31, 1925.

263,779. Preparations of solutions of hydrofluosilicic acid. Möller, Dr. W., and Kreth, Dr. W. December 23, 1925.

263,780. Process for the manufacture of readily-soluble salts of hydrofluosilicic acid. Möller, Dr. W., and Kreth, Dr. W. December 23, 1925.

263,795. Manufacture of acid dyestuffs of the anthraquinone series. I. G. Farbenindustrie Akt.-Ges. December 23, 1925.

263,816. Manufacture of monoazo-dyestuffs capable of being chromed. I. G. Farbenindustrie Akt.-Ges. December 23, 1925.

263,826. Manufacture of dyestuffs. Soc. of Chemical Industry in Basle. December 24, 1925.

263,830. Process of purifying gas of the kind derived from the distillation of coal or coke. Ammonia. January 4, 1926.

263,843. Manufacture of thiomorpholines of the anthraquinone series. I. G. Farbenindustrie Akt.-Ges. December 29, 1925.

263,844. Manufacture of alkylnaphthalenes chlorinated in the nucleus. I. G. Farbenindustrie Akt.-Ges. December 29, 1925.

263,845. Manufacture of benzanthrone derivatives. I. G. Farbenindustrie Akt.-Ges. December 30, 1925.

263,853. Aldehyde amine condensation products. Grasselli Chemical Co. March 13, 1925.

263,859. Recovery of reaction products from gases treated with electric arcs. I. G. Farbenindustrie Akt.-Ges. December 30, 1925.

263,861. Manufacture of vat-dyestuffs of the dibenzanthrone series. I. G. Farbenindustrie Akt.-Ges. December 30, 1925.

263,873. Condensation products of aromatic sulphonic acids. Chemische Fabrik Pott and Co. December 31, 1925.

263,877. Catalytic dehydrogenations. I. G. Farbenindustrie Akt.-Ges. January 4, 1926.

263,879. Manufacture of dyestuffs of the triaryl-methane series. I. G. Farbenindustrie Akt.-Ges. January 2, 1926.

Specifications Accepted with Date of Application

252,318. Oxygen, Apparatus for the production of. Soc Anon. le Salvoxyl. May 23, 1925.

263,201. Oxygenated products from hydrocarbons or oxidisable derivatives of hydrocarbons, Manufacture of. W. A. Caspari. November 11, 1925.

263,311. Camphene from pinene hydrochloride, Process for the production of. H. Gammay. January 7, 1926.

263,322. Treatment of residual liquors from the distillation of fermented liquids, Process and apparatus for—for obtaining dry fertilisers and glycerine therefrom. E. A. Barbet. January 30, 1926.

263,340. Tartaric salts, Process for the extraction of. W. E. Klaversteijn. February 15, 1926.

263,370. 1 : 4-diarylamino-5 : 8-dioxyanthraquinones, Process for the manufacture of. W. Carpmael. (*I. G. Farbenindustrie Akt.-Ges.*) April 13, 1926.

263,376. Aromatic nitro compounds, Reduction of. W. Carpmael. (*I. G. Farbenindustrie Akt.-Ges.*) April 21, 1926.

263,381. Purification and hydrogenation of liquid hydrocarbons, Process and apparatus for. C. D. Maze. April 27, 1926.

Applications for Patents

Asiatic Petroleum Co., Ltd., and Joyce, P. E. Oxidising, etc., heavy petroleum oils, etc. 32,959. December 30.

Barnard, C. M., and British Alizarine Co., Ltd. Manufacture of dyestuffs, etc. 379. January 6.

Bloxam, A. G., and I. G. Farbenindustrie Akt.-Ges. Process for producing fast dyeings. 330. January 5.

Brook, H., and Brook and Sons, Ltd., T. Driving-apparatus for circulating liquid in dye, etc., vessels. 33,010. December 31.

Calvert, J. Treatment of vegetable fibres. 33,005. December 31.

Carpmael, W., and I. G. Farbenindustrie Akt.-Ges. Manufacture of complex antimony compounds. 540. January 7.

Chemische Fabrik Pott and Co. Condensation products of aromatic sulphonic acids. 33,071. December 31. (Germany, December 31, 1925.)

Chemische Fabrik auf Actien, vorm E. Schering. Manufacture of new derivatives of 2-aminopyridine. 441. January 6. (Germany, January 27, 1926.)

Clayton, W., Gibbs, W. E., and Salt Union, Ltd. Preparation, etc., of sodium-chloride compositions. 32,999. December 31.

Combustion Utilities Corporation. Purification of tar oils. 32,978. December 30. (United States, September 22.)

Craven, A. B., and Yorkshire Dyeware and Chemical Co., Ltd. Manufacture of solid resin. 67. January 1.

Craven, A. B. Manufacture of cement for linoleum, etc. 143. January 3.

Davies, J. Magnesium oxychloride composition coverings or slabs. 475. January 7.

Duckham, A. M. Manufacture of coke. 128. January 3.

Evans, W. E., and Kohlenveredlung Akt.-Ges. Distillation of carbonaceous substances, etc. 33,092. December 31.

Fairweather, H. G. C., and Selden Co. Catalytic oxidation of sulphur dioxide. 174. January 4.

Grasselli Chemical Co. Vulcanisation of rubber, etc. 32,895. December 29. (United States, February 12.)

Grasselli Chemical Co. Aldehyde amine condensation products. 32,896. December 29. (United States, March 13, 1925.)
Grasselli Chemical Co. Aldehyde amine condensation products. 32,897. December 29. (United States, February 12.)
Hatfield, H. S. Apparatus for chemical analysis. 214. January 4.
Harris, J. E. G., Scottish Dyes, Ltd., and Wylam, B. Dyes, etc. 32,888. December 29.
Harris, J. E. G., Scottish Dyes, Ltd., and Wylam, B. Dyes, etc. 33,064. December 31.
Hereward, H. W., and Scottish Dyes, Ltd. Dyes, etc. 32,887. December 29.
I. G. Farbenindustrie Akt.-Ges. Manufacture of thiomorpholines of the anthraquinone series. 32,839. December 29. (Germany, December 29, 1925.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of alkylnaphthalenes. 32,840. December 29. (Germany, December 29, 1925.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of benzanthrone derivatives. 32,841. December 29. (Germany, December 30, 1925.)
I. G. Farbenindustrie Akt.-Ges. Recovery of reaction products from gases. 32,947. December 30. (Germany, December 30, 1925.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of dyestuffs. 32,956. December 30. (Germany, December 30, 1925.)
I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Drying gases. 54. January 1.
I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of valuable products from coal, tars, etc. 114. January 3.
I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of aldehydes from dicarboxylic acids. 513. January 7.
I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of anhydrous chlorides, etc. 514. January 7.
I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Purification of mixtures of oils. 515. January 7.
I. G. Farbenindustrie Akt.-Ges. Catalytic dehydrogenations. 115. January 3. (Germany, January 4, 1926.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of dyestuffs of the triarylmethane series. 127. January 3. (Germany, January 2, 1926.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of pharmaceutical compounds. 442. January 6.
Kritchevsky, W., and Prutsman, H. C. Chemicals for colouring fabrics. 32,851. December 29. (United States, May 5.)
Lacell, H. G., and New Metallurgy, Ltd. Electrolytic production of metals. 425. January 6.
Lacell, H. G., and New Metallurgy, Ltd. Production of chlorides from metallic oxides, etc. 609. January 8.
Leek, A. E. Separation of solids and liquids from suspensions, etc. 566. January 8.
Norsk Hydro-Elektrisk Kvaelstofaktieselskab. Production of granulated nitrate of lime. 223. January 4. (Norway, January 14, 1926.)
Plassmann, J. Low-temperature distillation furnace. 435. January 6. (Germany, August 5, 1926.)
Pope, Sir W. J. Manufacture of ketones. 33,048. December 31.
Roessler and Hasslacher Chemical Co. Accelerators for the vulcanisation of rubber. 509. January 7. (United States, November 26, 1926.)

High Elastic Limit Steel

MR. T. M. SERVICE recently read a paper on "High Elastic Limit Steel for Shipbuilding and Marine Engine Work" before the Institution of Engineers and Shipbuilders, in Glasgow. In the course of the paper Mr. Service said that the production of high elastic steel was hastened by a desire on the part of the Admiralty to obtain a steel suitable for warship building which would permit of working stresses being adopted considerably higher than those allowable in mild steel. This admitted of a saving in hull structure which could be devoted to the improvement of the offensive, defensive and other qualities in design. The first consignment of steel to the Admiralty's requirements was delivered in 1922. It was tested mechanically and also under ballistic attack, and as the exacting conditions were met satisfactorily the quality was adopted for special structural purposes. In addition to high limit of proportionality a high degree of toughness was claimed for this new quality of steel. Mr. Service went on to compare the method of manufacture of the new quality steel with that of mild steel, emphasising that it was absolutely imperative in the special steel to have the material as solid as possible and free from surface blowholes. In conclusion, he stated that the steel which he described was specifically asked for by the Admiralty, and that all the experimental work involved in its manufacture was carried out at the experimental laboratory of William Beardmore and Co., Ltd., at Parkhead Forge.

Sodium Sulphate in Western Canada

Publication of Results of Investigation

THE search for potash during the years of the Great War led to the staking of claims on many of the "alkali lakes" and sloughs which occur in numerous localities in the morainic areas of the prairies, as well as in British Columbia, in the hope that potash or other valuable salts would be found in commercial quantities. Although the search for potash, up to the present, has been disappointing, the prospecting of these areas has demonstrated that Canada possesses large reserves of sodium compounds, principally in the form of sulphates, carbonates and chlorides. The Dominion Department of Mines first became interested in these deposits in 1911 while investigating the sodium chloride springs of northern Manitoba. In the fall of that year a number of the sulphate occurrences in Saskatchewan and Alberta were visited, but owing to the excessive rains the deposits were under water, and only a few brines were obtained. Owing to pressure of other work, the investigation of the alkali deposits of Western Canada could not be undertaken by the Mines Branch until the field season of 1921, but since that time the work has been continuous.

During the summer of 1918 the discovery of a large deposit of potash-bearing salts was reported and featured in western newspapers, and in a short time all the lakes and sloughs of the Prairie Provinces, which showed the least indication of being saline, were staked. The discovery was not substantiated on investigation, and many who had staked or leased claims allowed them to lapse without the slightest effort to determine the character of the material in the deposits which they had leased. Those, however, who kept their leases in good standing found on examination that, although there were no commercial occurrences of potash in the majority of the deposits, large quantities of Glauber's salt are present in the lake beds. The investigation of these deposits by the Mines Branch, Department of Mines, has been conducted in the field during the past four years (1921-1924) and has furnished a large amount of valuable information. Numerous samples have been collected and analysed in the Departmental laboratories. Considerable data have been collected and compiled by Mr. L. Heber Cole and others of the Mines Branch staff. These are published in Report No. 646—"Sodium Sulphate of Western Canada"—copies of which may be obtained by persons interested on application to the Natural Resources and Industrial Information Branch, The Canadian Building, Trafalgar Square, London, S.W.1.

International Holdings: Injunction Fails

IN the Chancery Division on Wednesday, before Mr. Justice Astbury, there was a motion in the case of Bristow against the International Holdings Co., Ltd., for an injunction to prevent the defendant company from acting upon an injunction, which the plaintiff, Colonel Bristow, said was invalidly passed. Mr. Archer, K.C., for Colonel Bristow, said he proposed to take no order on the motion, but to take leave to apply for an early trial of the action, and to amend the writ by adding the managing director and the company as a defendant. After Mr. Bennett, K.C., had replied for the company, the judge said that as Mr. Bennett had an answer to the motion, Mr. Archer must either bring on his motion or allow it to be dismissed. Mr. Bennett objected to the proposed amendment to the writ, and the motion was dismissed with costs.

Laboratory Apparatus

FROM Robert Hornby, 7, Carlisle Street, Dean Street, London, W., we have received an abridged price list of scientific apparatus, laboratory glassware, etc., which the firm are taking up as an additional line to their existing departments. It covers the usual laboratory requirements in the shape of beakers, flasks, tubes, measuring cylinders, acid-resisting basins, Bunsen burners, triangles, etc. In addition to general laboratory apparatus the firm stock special apparatus for chemical and allied industries, foodstuffs, textiles, explosives, oil testing, and fuels, metallurgical and mining assays, bacteriology, and gas analysis, centrifuges, calorimeters, furnaces, mills, presses, vacuum apparatus, distilling apparatus, pumps, thermostats, etc. The new scientific apparatus department is in charge of Dr. L. M. Hinchberg.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. to 7d. per lb. Crude 60's, 1s. 8d. to 1s. 10½d. per gall.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 3d. per gall. Steady. 97/99.—2s. to 2s. 6d. per gall. Pale, 95%, 1s. 10d. to 2s. 4d. per gall. Dark, 1s. 9d. to 2s. 3d. per gall.

ANTHRACENE.—A quality, 2½d. to 3d. per unit. 40%, 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.; both according to gravity.

BENZOLE.—Crude 65's, 1s. 3½d. to 1s. 4½d. per gall., ex works in tank wagons. Standard Motor, 1s. 11½d. to 2s. 2½d. per gall., ex works in tank wagons. Pure, 2s. 2½d. to 2s. 5½d. per gall., ex works in tank wagons. Steady.

TOLUOLE.—90%, 2s. to 2s. 6d. per gall. Firm. Pure, 2s. 3d. to 2s. 8d. per gall.

XYLOL.—2s. 3d. to 2s. 8d. per gall. Pure, 4s. per gall.

CREOSOTE.—Cresylic, 20/24%, 10½d. per gall. Standard specification, 6¾d. to 9d.; middle oil, 7½d. to 8d. per gall. Heavy, 8¾d. to 9¼d. per gall.

NAPHTHA.—Crude, 10d. to 1s. 1d. per gall. according to quality. Solvent 90/160, 2s. to 2s. 1d. per gall. Solvent 95/160, about 1s. 11d. per gall. Solvent 90/190, 1s. 3½d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £8 per ton. Whizzed or hot pressed, £9 per ton.

NAPHTHALENE.—Crystals, £11 10s. to £12 10s. per ton. Quiet, Flaked, £12 10s. to £13 per ton, according to districts.

PITCH.—Medium soft, 112s. 6d. to 130s. per ton, according to district, Prices nominal, and more inquiry.

PYRIDINE.—90/140, 9s. 6d. to 17s. per gall. Nominal. 90/180, 7s. 6d. per gall. Heavy, 7s. to 10s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—8s. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—1s. 6d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—9¼d. per lb. naked at works.

ANILINE SALTS.—9½d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—4d. to 4½d. per lb. Quiet.

m-CRESOL 98/100%.—2s. 8¾d. per lb. Quiet.

p-CRESOL 32/34° C.—2s. 8¾d. per lb. Quiet.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—7d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb. d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—9d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 per ton. Scarce. Grey, £17 5s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£8 5s. to £10 per ton and upwards, according to grade and locality. Very scarce and in fair demand.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.

RED LIQUOR.—10d. to 11d. per gall. 16° Tw.

WOOD CREOSOTE.—2s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 10d. to 4s. per gall., 60% O.P. Solvent, 4s. per gall., 40% O.P. Both scarce and in fair demand.

WOOD TAR.—£4 to £5 per ton and upwards, according to grade.

BROWN SUGAR OF LEAD.—£41 to £42 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5½d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£46 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—5s. 3d. per lb.

ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

Acid, Acetic, Pure, 80%.—£39 per ton ex wharf London in glass containers.
Acid, Acetyl Salicylic.—2s. 4d. to 2s. 6d. per lb. Firm.
Acid, Benzoic B.P.—2s. to 2s. 3d. per lb., according to quantity.
Acid, Boric B.P.—Crystal, £40 per ton; powder, £44 per ton. Carriage paid any station in Great Britain, in ton lots.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—1s. 3½d. to 1s. 4½d. per lb., less 5%. Weak market.
Acid, Gallic.—2s. 8d. per lb. for pure crystal, in cwt. lots.
Acid, Pyrogallic, Crystals.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
Acid, Salicylic, B.P.—1s. 4½d. to 1s. 6d. per lb. Firm and good inquiry. Technical.—11½d. to 1s. per lb. Good inquiry.
Acid, Tannic B.P.—2s. 9d. to 2s. 11d. per lb.
Acid, Tartaric.—1s. 0½d. per lb., less 5%.
Amidol.—9s. 6d. per lb., d/d.
Acetanilide.—1s. 7d. to 1s. 8d. per lb. for quantities.
Amidopyrin.—11s. 6d. per lb.
Ammonium Benzoate.—3s. 3d. to 3s. 6d. per lb., according to quantity.
Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: lump, 1s. per lb.; powder, 1s. 3d. per lb.
Aspirin.—2s. 4d. per lb. Good demand.
Atropine Sulphate.—11s. per oz. for English make.
Barbitone.—8s. 9d. per lb.
Benzonaphthol.—3s. 3d. per lb. spot.
Bismuth Carbonate.—12s. 3d. to 14s. 3d. per lb.
Bismuth Citrate.—9s. 3d. to 11s. 3d. per lb.
Bismuth Salicylate.—10s. to 12s. per lb.
Bismuth Subnitrate.—10s. 6d. to 12s. 6d. per lb., all above bismuth salts, according to quantity
Bismuth Nitrate.—6s. 9d. per lb.
Bismuth Oxide.—13s. 9d. per lb.
Bismuth Subchloride.—11s. 9d. per lb.
Bismuth Subgallate.—9s. 9d. per lb.
Borax B.P.—Crystal, £24 per ton; powder, £25 per ton. Carriage paid any station in Great Britain, in ton lots.
Bromides.—Potassium, 1s. 9d. to 1s. 11d. per lb.; sodium, 2s. to 2s. 2d. per lb.; ammonium, 2s. 3d. to 2s. 4d. per lb., all spot.
Calcium Lactate.—1s. 4d. to 1s. 6d.
Chloral Hydrate.—3s. 3d. to 3s. 6d. per lb., duty paid.
Chloroform.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
Creosote Carbonate.—6s. per lb.
Ether Meth.—1s. 1d. to 1s. 11½d. per lb., according to sp. gr. and quantity. Ether purif. (Aether B.P., 1914), 2s. 3d. to 2s. 4d., according to quantity.
Formaldehyde.—£39 per ton, in barrels ex wharf.
Guaiacol Carbonate.—6s. 6d. to 7s. per lb.
Hexamine.—2s. 4d. to 2s. 6d. per lb.
Homatropine Hydrobromide.—30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydrogen Peroxide (12 vols.).—1s. 8d. per gallon f.o.r. makers' works, naked.
Hydroquinone.—4s. per lb., in cwt. lots.
Hypophosphites.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
Iron Ammonium Citrate B.P.—2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.
Iron Perchloride.—22s. per cwt., 112 lb. lots.
Magnesium Carbonate.—Light Commercial, £33 per ton net.
Magnesium Oxide.—Light Commercial, £67 10s. per ton, less 2½%; Heavy Commercial, £22 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.
Menthol.—A.B.R. recrystallised B.P., 18s. 9d. per lb. net; Synthetic, 12s. to 14s. per lb., according to quantity; Liquid (95%), 12s. per lb.; Detached Cryst., 15s. per lb.
Mercurials.—Red Oxide, 6s. 5d. to 6s. 7d. per lb., levig., 6s. to 6s. 1d. per lb.; Corrosive Sublimate, Lump, 4s. 8d. to 4s. 10d. per lb., Powder, 4s. 2d. to 4s. 3d. per lb.; White Precipitate, 4s. 10d. to 5s. per lb., Powder, 4s. 11d. to 5s. 1d. per lb., Extra Fine, 5s. 1d. to 5s. 2d. per lb.; Calomel, 5s. 3d. to 5s. 5d. per lb.; Yellow Oxide, 5s. 10d. to 5s. 11d. per lb.; Persulph., B.P.C., 5s. 1d. to 5s. 2d. per lb.; Sulph. nig., 4s. 10d. to 4s. 11d. per lb.
Methyl Salicylate.—1s. 9d. per lb.
Methyl Sulphonal.—15s. 6d. per lb.
Metcl.—11s. per lb. British make.
Paraformaldehyde.—1s. 9d. per lb. for 100% powder.
Paraldehyde.—1s 4d. per lb.
Phenacetin.—3s. 9d. to 4s. per lb.
Phenazone.—5s. 9d. to 6s. per lb.
Phenolphthalein.—6s. to 6s. 3d. per lb.
Potassium Bitartrate 99/100% (Cream of Tartar).—82s. per cwt., less 2½% for ton lots. Dearer.
Potassium Citrate.—1s. 11d. to 2s. 2d. per lb.
Potassium Ferricyanide.—1s. 9d. per lb., in cwt. lots.
Potassium Iodide.—16s. 8d. to 17s. 2d. per lb., according to quantity.
Potassium Metabisulphite.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
Potassium Permanganate.—B.P. crystals, 6½d. per lb., spot.
Quinine Sulphate.—2s. per oz., 1s. 8d. to 1s. 9d. per oz. in 100 oz. tins.
Resorcin.—4s. to 4s. 3d. per lb., spot.
Saccharin.—55s. per lb. Quiet.
Salol.—3s. to 3s. 3d. per lb.
Sodium Benzoate, B.P.—1s. 10d. to 2s. 2d. per lb.
Sodium Citrate, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb. B.P.C., 1923—2s. 1d. to 2s. 2d. per lb. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.
Sodium Ferrocyanide.—4d. per lb. carriage paid.
Sodium Hyposulphite, Photographic.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.
Sodium Nitroprusside.—16s. per lb.
Sodium Potassium Tartrate (Rochelle Salt).—80s. to 85s. per cwt., according to quantity.
Sodium Salicylate.—Powder, 1s. 10d. to 1s. 11d. per lb. Crystal, 1s. 11d. to 2s. per lb.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.
Sodium Sulphite, anhydrous, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.
Sulphonal.—10s. 6d. per lb.
Tartar Emetic, B.P.—Crystal or powder, 2s. to 2s. 2d. per lb.
Thymol.—Purif., 11s. to 12s. per lb., according to quantity; natural, 17s. 6d. per lb.

Perfumery Chemicals

Acetophenone.—7s. 3d. per lb.
Aubepine (ex Anethol).—10s. 6d. per lb.
Amyl Acetate.—2s. per lb.
Amyl Butyrate.—5s. 6d. per lb.
Amyl Salicylate.—3s. per lb.
Anethol (M.P. 21/22° C.).—5s. 6d. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. per lb.
Benzyl Alcohol free from Chlorine.—2s. per lb.
Benzaldehyde free from Chlorine.—2s. 6d. per lb.
Benzyl Benzoate.—2s. 3d. per lb.
Cinnamic Aldehyde Natural.—18s. per lb.
Coumarin.—11s. per lb.
Citronellol.—15s. per lb.
Citral.—9s. 6d. per lb.
Ethyl Cinnamate.—10s. per lb.
Ethyl Phthalate.—3s. per lb.
Eugenol.—9s. 6d. per lb.
Geraniol (Palmarosa).—19s. per lb.
Geraniol.—6s. 6d. to 10s. 6d. per lb.
Heliotropine.—4s. 10d. per lb.
Iso Eugenol.—13s. 6d. per lb.
Linalol.—Ex Shui Oil, 12s. per lb. Ex Bois de Rose, 16s. per lb.
Linalyl Acetate.—Ex Shui Oil, 14s. 6d. per lb. Ex Bois de Rose, 18s. 6d. per lb.
Methyl Anthranilate.—9s. per lb.
Methyl Benzoate.—4s. 6d. per lb.
Musk Ketone.—36s. per lb.
Musk Xylol.—8s. 6d. per lb.
Nerolin.—3s. 9d. per lb.
Phenyl Ethyl Acetate.—12s. per lb.
Phenyl Ethyl Alcohol.—11s. per lb.
Rhodinol.—28s. 6d. per lb.
Safrol.—1s. 6d. per lb.
Terpineol.—1s. 6d. per lb.
Vanillin.—17s. 3d. to 19s. per lb.

Essential Oils

Almond Oil.—11s. 6d. per lb.
Anise Oil.—3s. 3d. per lb.
Bergamot Oil.—31s. 6d. per lb.
Bourbon Geranium Oil.—12s. per lb.
Camphor Oil.—63s. 6d. per cwt.
Cananga Oil, Java.—20s. per lb.
Cinnamon Oil, Leaf.—5½d. per oz.
Cassia Oil, 80/85%.—8s. 6d. per lb.
Citronella Oil.—Java, 85/90%, 2s. 4d. per lb. Ceylon, pure, 1s. 11d. per lb.
Clove Oil.—6s. 3d. per lb.
Eucalyptus Oil, 70/75%.—2s. per lb.
Lavender Oil.—Mont Blanc 38/40%, Esters, 19s. per lb.
Lemon Oil.—9s. per lb.
Lemongrass Oil.—4s. 6d. per lb.
Orange Oil, Sweet.—9s. 9d. per lb.
Otto of Rose Oil.—Bulgarian, 70s. per oz. Anatolian, 30s. per oz.
Palma Rosa Oil.—10s. per lb.
Peppermint Oil.—Wayne County, 25s. 6d. per lb. Japanese, 9s. 6d. per lb.
Petitgrain Oil.—8s. 3d. per lb.
Sandalwood Oil.—Mysore, 26s. per lb. Australian, 17s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, January 12, 1927.

THERE has been a better demand for the majority of chemical products during the past week, although it is still noticed that consumers are confining their orders to small lots; but, on the other hand, orders are coming in with greater regularity. Prices on the whole remain exceptionally firm, and in one or two products, such as oxalic, the market is higher. Export inquiry is fair, but a large amount of business has to be returned owing to unacceptable prices being put forward.

General Chemicals

ACETONE has been in better request, and price is now steady at about £62 per ton.

ACID ACETIC is in day-to-day demand, and price is very steady, as has been the case for some time past.

ACID CITRIC.—The market continues dull, with price unchanged at 1s. 2¼d.

ACID FORMIC.—Quite a fair business has been transacted, and price is inclined to be firmer.

ACID LACTIC is in good demand, with price for 50% by weight quality technical about £43 per ton.

ACID OXALIC has sharply advanced, and spot supplies are extremely scarce, and the price to-day can be taken at 4d. per lb.

ACID TARTARIC.—Continues dull at about 11½d. per lb.

ALUMINA SULPHATE continues in good demand at £6 5s. per ton, for 17-18% technical quality.

AMMONIUM CHLORIDE is steady at about £18 15s. to £19 per ton.

BARIUM CHLORIDE is slightly easier; with smaller demand price to-day is about £9 10s. per ton.

COPPER SULPHATE is in better request, and price inclined to go higher at £24 per ton.

CREAM OF TARTAR continues firm at about £81 to £82 per ton.

EPSOM SALTS are steady at about £5 10s. per ton.

FORMALDEHYDE is in fair request at about £42 per ton.

LEAD ACETATE.—Quite a substantial business has been transacted, and price shows no change at £45 per ton for white and £43 per ton for brown.

METHYL ACETONE continues firm at £58 to £60 per ton.

METHYL ALCOHOL is steady at £46 to £48 per ton with a fair demand.

POTASSIUM CHLORATE is in good request, especially on export account at about 3½d. per lb.

POTASSIUM PERMANGANATE is slightly easier, with demand disappointing.

POTASSIUM PRUSSIATE is firm and scarce for immediate delivery; present price, 7½d. per lb.

SODIUM ACETATE is steady at £20 to £20 5s. per ton.

SODIUM BICHROMATE.—A good business is being transacted at British makers' prices of 3¼d. per lb.

SODIUM HYPOSULPHITE.—Continental material is dearer and quite a fair amount of business has been transacted at British makers' price.

SODIUM NITRITE is steady at £19 10s. to £20 per ton.

SODIUM PRUSSIATE is firm and in good demand at about 4½d. per lb.

SODIUM SULPHIDE.—Continental material dearer and demand good.

ZINC SULPHATE is higher, and in rather short supply for near delivery.

Coal Tar Products

The market for coal tar products is fairly quiet, with little change to report from last week.

90's BENZOL is quoted at 1s. 11d. per gallon on rails, while the motor quality is worth about 1s. 10d. to 1s. 10½d. per gallon.

PURE BENZOL is unchanged at 3s. 9d. to 4s. per gallon.

CREOSOTE OIL is worth about 7½d. to 8d. per gallon, on rails at works in the country, while the price in London is from 8¾d. to 9d. per gallon.

CRESYLIC ACID is quoted at 2s. per gallon, on rails for the pale quality 97-99%, while the dark quality 95-97% is worth about 1s. 11d. per gallon.

SOLVENT NAPHTHA is fairly easy, and is quoted at 1s. 7d. to 1s. 8d. per gallon, on rails.

HEAVY NAPHTHA is unchanged at 1s. 6d. to 1s. 7d. per gallon, on rails.

NAPHTHALENES are also unchanged, the 76-78 quality being quoted at about £8 to £9 per ton, while the 74-76 quality is worth about £8 to £8 5s. per ton, at makers' works.

PITCH is unchanged at 120s. to 140s. per ton, f.o.b. U.K. port.

Latest Oil Prices

LONDON.—LINSEED OIL very firm at 12s. 6d. to 7s. 6d. advance. Spot, £32, ex mill; January to August, £30 10s.; September-December, £30 12s. 6d. RAPE OIL quiet. Crude extracted naked, £45; technical, refined, £47. COTTON OIL firm at 20s. advance. Refined common edible, £39; Egyptian crude, £32 10s.; deodorised, £41. TURPENTINE inactive. American, spot to December, 53s. per cwt.

HULL.—January 12.—LINSEED OIL.—Spot to January-April, £31 2s. 6d.; May-August, £31. COTTON OIL.—Bombay crude, £31 10s.; Egyptian crude, £32 10s.; edible refined, £36 5s.; technical, £35 10s.; deodorised, £38 5s. PALM KERNEL OIL.—Crushed, naked, 5½ per cent., £38 10s. GROUNDNUT OIL.—Extracted-crushed, £41 10s.; deodorised, £45 10s. SOYA OIL.—Extracted and crushed, £34; deodorised, £37 10s. RAPE OIL.—Crude-extracted, £44; refined, £46 per ton, net, cash terms, ex-mill. CASTOR OIL and COD OIL unaltered.

Nitrogen Products

Export.—There is little change in the position since the last report. The first weeks of the year are usually quiet in the export trade, and as the British producers have very little to sell for export sales are not being pressed. Quotations remain steadily at £11 5s. to £11 7s. 6d. per ton, f.o.b. United Kingdom port, in single bags. Reports from the Continent indicate that a good demand is anticipated.

Home.—There has been a fair demand for the home trade during the last few weeks, and this is slightly greater than last year owing to the open season and the fact that some farmers are already working on the land. There have been no changes in prices which were announced by the producers last November.

Nitrate of Soda.—There is little fresh to report. Owing to the peculiar state of this market it is probable that there may be an actual shortage in consuming centres this season, although a large stock will be carried over in Chile.

Calcium Cyanamide

SOME interest in calcium cyanamide for the sugar beet crop is already being shown. The January price is £9 12s. per ton delivered in four-ton lots, carriage paid to any railway station in Great Britain —showing the unit cost of about 10s. 1d.

Retirement of Dyers' Association Director

AT the beginning of the year Mr. Thorp Whitaker, a director of the Bradford Dyers' Association, retired from his position as manager of the buying department of the association. For twenty-three years Mr. Whitaker was the chemist and buyer at the dyeworks of Edward Ripley and Son, Ltd., and on the formation of the B.D.A., in 1900, became a director and took up a position at the head office in Well Street. He thus completed fifty years' service in the dyeing industry. So valuable was his experience and judgment in this work that on the outbreak of the war Mr. Whitaker was asked to assist the Board of Trade in its buying and distribution of colours—a service for which he was rewarded by the O.B.E. He is to remain in a consultative capacity with the B.D.A. as a director.

Coal Distillation Company to be Formed

A COMPANY is now in the course of formation with a capital of £250,000 for the purpose of acquiring from Sensible Heat Distillation, Ltd., of 100, Victoria Street, London, the rights for Great Britain in the "L. & N." process for the distillation of coal, worked out by Messrs. Laing and Nielsen. The name of the proposed company is to be "L. and N." Coal Distillation, Ltd.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, January 12, 1927.

DURING the past week business in the heavy chemical market has been fairly satisfactory, good inquiry being received both for home and export. Prices are steady, with the exception of arsenic, which is short for early delivery and shows an upward tendency.

Industrial Chemicals

ACID ACETIC, 98-100%.—£55 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 to £38 per ton; 80% technical, £37 to £38 per ton, c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated or small flakes, £34 per ton; powder, £36 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In rather poor demand, and price reduced to about 6¾d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—In little demand, spot material quoted 1s. 3d. per lb., less 5% ex store. On offer from the Continent at about 1s. 2¾d. per lb., less 5% ex wharf.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. 9d. per carboy. Dearsenicated quality 6s. 3d. per carboy, ex works.

ACID NITRIC, 80°.—Usual steady demand, and price unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98-100%.—In moderate demand, and price unchanged at about 3¾d. per lb., ex store, spot delivery. Price 3½d. per lb., c.i.f. U.K. ports, prompt shipment from the Continent.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Unchanged at about 11¼d. per lb., less 5% ex store, spot delivery. Offered for early shipment at 11⅛d. per lb., less 5% ex wharf.

ALUMINA SULPHATE, 17-18%, IRON FREE.—Spot material on offer at about £6 per ton, ex store. Quoted £5 8s. 6d. per ton, c.i.f. U.K. ports. Prompt shipment from the Continent.

ALUM, POTASH.—Lump quality quoted £8 10s. per ton, c.i.f. U.K. ports. Crystal powder at 5s. per ton less. Lump, on spot, quoted £9 5s. per ton, ex store. Crystal powder £8 15s. per ton, ex store.

AMMONIA ANHYDROUS.—On offer for early delivery at 10½d. per lb., ex store. Containers extra, and returnable.

AMMONIA CARBONATE.—Lump £37 per ton; powder £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°. — Unchanged at about 2½d. to 3d. per lb. delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers, crystals, of British manufacture, quoted £23 10s. to £24 10s. per ton, ex station. Continental make on offer at about £21 per ton, c.i.f. U.K. ports. Fine white crystals of Continental manufacture quoted £18 10s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—In moderate demand. Offered for early delivery from mines at about £19 15s. per ton, ex wharf. Spot material quoted £20 per ton, ex store.

BARIUM CARBONATE, 98-100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98-100%.—Large white crystals now quoted £8 2s. 6d. per ton, c.i.f. U.K. ports, packed in bags. Casks 7s. 6d. per ton extra. Offered for spot delivery at £9 15s. per ton, ex store.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers, £8 per ton, ex station; minimum, 4-ton lots. Spot material 10s. per ton extra. Continental now quoted £7 10s. per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £19 10s. per ton; crystals, £20 per ton; powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacture, price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, ex station. Continental on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or at £4 12s. 6d. per ton, f.o.b. U.K. ports, for export.

COPPER SULPHATE.—English material quoted £23 per ton, f.o.b. U.K. ports. Continental on offer at £21 10s. per ton, c.i.f. U.K. ports.

FORMALDEHYDE, 40%.—On offer for prompt shipment at £38 5s. per ton, c.i.f. U.K. ports. Spot material unchanged at £40 per ton, ex store.

GLAUBER SALTS.—English material quoted £4 per ton, ex store or station. Continental now offered at about £2 17s. 6d. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material now on offer at about £35 10s. per ton, ex store.

LEAD, WHITE.—Quoted £36 per ton, ex store.

LEAD ACETATE.—White crystals quoted £44 per ton, c.i.f. U.K. ports; brown about £40 5s. per ton, c.i.f. U.K. ports. White crystals on offer at about £45 per ton, ex store, spot delivery.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

POTASH, CAUSTIC, 88-92%.—Solid quality, £27 5s. per ton, minimum 15-ton lots, c.i.f. U.K. ports. Smaller quantities 15s. per ton extra. Liquid quality, 50° Be, £14 per ton, c.i.f. U.K. ports; minimum, 15-ton lots. Smaller quantities 7s. 6d. per ton extra.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE.—96-98%, quoted £25 5s. per ton, ex wharf, early delivery. Spot material on offer at £26 10s. per ton, ex store; 90-94% quality quoted £22 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 98-100%.—Powdered quality offered from the Continent at £24 10s. per ton, c.i.f. U.K. ports. Crystals, £2 per ton extra.

POTASSIUM NITRATE (SALTPETRE).—Rather cheaper quotations from the Continent. Now quoted £21 15s. per ton, c.i.f. U.K. ports. Spot material unchanged at about £24 per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 6¾d. per lb., ex store, spot delivery. On offer for early shipment at 6½d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—In good demand, and price unchanged at about 7⅝d. per lb., ex store. Offered from the Continent at 7½d. per lb., ex wharf.

SODA CAUSTIC.—Powder, 98/99%, £19 7s. 6d. per ton; 76/77%, £15 10s. per ton; 70/72%, £14 10s. per ton, carriage paid station, minimum four-ton lots on contract. Spot material, 10s. per ton extra.

SODIUM ACETATE.—English material quoted £22 10s. per ton, ex store. Continental on offer at about £19 per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5s. 5s. per ton, ex quay or station; powder or pea quality, £1 7s. 6d. per ton more; alkali, 59%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture now quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals, photographic quality, £14 10s. per ton, ex store, spot delivery. Continental commercial quality quoted £8 per ton, c.i.f. U.K. ports or £8 10s. per ton, ex store.

SODIUM NITRATE.—Ordinary quality quoted about £12 12s. 6d. per ton, ex store. Refined quality 5s. per ton extra.

SODIUM NITRITE, 100%.—£21 5s. per ton, ex store, spot delivery.

SODIUM PRUSSIATE (YELLOW).—Slightly dearer at 4½d. per lb., ex store, spot delivery. Offered for prompt shipment from the Continent at a fraction less.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption £3 7s. 6d. per ton, ex works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE.—60/65%, solid, £12 10s. per ton; broken £13 10s. per ton; flake, £14 10s. per ton; crystals, 31/34%, £8 10s. per ton, and £9 per ton, according to quality delivered buyer's works, minimum four-ton lots on contract. Price for spot 5s. per ton, extra for solid, 2s. 6d. per ton, extra for crystals 60/62%, solid quality offered from the Continent at about £9 7s. 6d. per ton, c.i.f. U.K. ports; broken 15s. per ton extra.

SULPHUR.—Sicilian suppliers have again advanced their price. Nominal price ex store is now as follows: flowers, £12 10s. per ton; roll, £11 10s. per ton; rock, £11 10s. per ton; floristella, £11 per ton; ground American, £9 15s. per ton.

ZINC CHLORIDE.—British material 98/100% quoted £24 15s. per ton, f.o.b. U.K. ports. 98/100% solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered 20s. per ton, extra.

ZINC SULPHATE.—Continental material on offer at about £10 10s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates

H. ACID.—3s. 3d. per lb., per 100%. Some inquiries.

NAPHTHIONIC ACID.—1s. 6d. per lb., per 100%. Some inquiries.

BENZALDEHYDE.—2s. 3d. per lb. Some inquiries.

DIMETHYLANILINE.—2s. per lb. Some inquiries.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb., per 100%. Some inquiries.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, January 13, 1927.

The position of the chemical market here has shown a slight change for the better during the past week, and there has been rather more inquiry about for a fair number of lines, mainly from home users, little inquiry coming to hand at the moment on overseas account. Price fluctuations have been within a narrow compass, the general tendency being towards continued steadiness, although in one or two instances, where for various reasons prices firmed up in the course of the coal dispute, there are signs of a gradual return to former levels.

Heavy Chemicals

Fair sales of bicarbonate of soda are being effected, and quotations are maintained at £10 10s. per ton. The demand for phosphate of soda remains restricted at from £12 10s. to £12 15s. per ton. Glauber salts are also rather slow, with current values at £3 10s. to £3 15s. per ton. Bichromate of soda is now on offer at about 3½d. per lb. and a fair amount of business is being done. So far there has been little further change in the position of prussiate of soda, prices keeping firm at 4¼d. to 4½d. per lb. and offers still being rather scarce. For hyposulphite of soda, buying interest is still restricted, with photographic quality quoted at £15 to £15 5s. per ton, and commercial at about £10 per ton. Chlorate of soda is on the easy side, although not altered since last week, demand being quiet at 3d. per lb. Bleaching powder is in moderate request at £8 per ton. Nitrite of soda is on offer at £19 10s. per ton, but the demand is rather slow. There is a steady call for caustic soda at the revised range of from £14 10s. per ton for 60 per cent. to £16 10s. for 76 per cent. quality. Saltcake is steady and in moderate request at £3 10s. per ton. Sulphite of soda is quiet but there has been little alteration in price levels, about £10 5s. per ton being asked for 60–65 per cent. concentrated solid and £8 per ton for the commercial quality. Alkali meets with a quietly steady demand at round £6 15s. per ton.

Permanganate of potash is still an easy section of the market and sales are relatively slow; for the commercial material quotations range from 4¾d. to 5d. per lb., with B.P. quality offering at 6⅛d. Chlorate of potash also is on the easy side, although perhaps not quotably changed at 3½d. per lb.; only a quiet business is being put through. Caustic potash is maintained at round £29 per ton, and a quiet steady demand is being met with. Yellow prussiate of potash is in moderate request, and values are well held at 7¼d. per lb. Bichromate of potash is still quoted at about 4⅝d. per lb., but inquiry remains of limited extent. There has been little change in the position of carbonate of potash, current values still being on the basis of £26 to £26 5s. per ton, and demand on a fair scale.

Acetate of lead keeps fairly steady at £44 10s. to £45 per ton for white, and £41 for brown material, but business is limited. Acetate of lime is in a similar position, grey offering at £17 5s. and brown at about £9 per ton. Nitrate of lead is about unchanged at £40 per ton, with inquiry still slow. Arsenic is still very firm and in fair request at about £17 per ton at the mines for white powdered Cornish makes. Sulphate of copper meets with a quietly steady inquiry for shipment, and values are firm at £24 10s. per ton, f.o.b.

Acids and Tar Products

There is not much demand for tartaric acid at the moment, and prices are rather easy at 11¼d. to 11½d. per lb. Citric acid also is attracting little buying interest, with current offers at round 1s. 3d. per lb. Oxalic acid is fully maintained at 3⅝d. per lb. Acetic acid is steady at £37 to £37 10s. per ton for 80 per cent. commercial material, and £66 for glacial, a fair demand still coming through.

Among the by-products, solvent naphtha is quiet and easier at about 1s. 9d. per gallon. Pitch is quoted at in the region of £6 per ton, f.o.b., but offers for prompt are still limited. Carbolic acid is rather slow at round 6¾d. per lb. for crystals. Creosote oil keeps strong with about 8¼d. per gallon being quoted, although there does not seem to be much of this to be bought yet.

F. Hulse & Co., Ltd.

(In Voluntary Liquidation)

Mr. Chas. Murgatroyd, receiver and manager for the debenture holders and liquidator in the voluntary winding-up of F. Hulse and Co., Ltd., complains that our reports of the statutory meeting of creditors (The Chemical Age, November 20, 1926, p. 502, and November 27, 1926, p. 523) were "misleading and inaccurate," and draws attention to the following facts:—

1. "A debenture was not made on April 19, 1923." [The date was November 19, 1923, and was correctly given in our first report.]
2. "No debenture for £300 was issued." [The amount was £3,000, and was correctly given in our first report.]
3. "A committee of inspection was not appointed under section 188 of the Companies (Consolidation) Act, 1908."
4. "The British Dyestuffs Corporation, Ltd., have never stated that they intended to make application for compulsory liquidation."
5. "No resolution under my chairmanship was passed regarding compulsory liquidation."
6. "Hulse (Dyes), Ltd., was not financed by F. Hulse and Co., Ltd. . . . The whole of the £1,600 was paid in cash by Mr. and Mrs. Hulse, and not by F. Hulse and Co., Ltd." [F. Hulse and Co., Ltd., which went into voluntary liquidation on October 26, 1926, was registered April 7, 1922, with a nominal share capital of £100 in £1 shares, of which £15 only was issued, five shares each being allotted to Mr. and Mrs. Hulse and five shares to a Miss Hulse. The debenture for £3,000 was in the names of Mr. and Mrs. Hulse. Hulse (Dyes), Ltd., which went into voluntary liquidation on September 20, 1926, was registered February 18, 1926, with a share capital of £100, divided into 2,000 shares of 1s. each, all held by Mr. and Mrs. Hulse, 1,900 and 100 shares respectively. A first mortgage debenture for £1,500 was issued to Mrs. Hulse on July 5, 1926.]

Manufacturing Chemists' Voluntary Liquidation

The statutory meeting of the creditors of Fletcher, Ritson and Co., Ltd., manufacturing chemists, of Gower Street, Bootle, was held on Friday, January 7, in Liverpool. Mr. P. S. Booth, the liquidator of the company, submitted a statement of affairs which showed liabilities of £1,594 13s. 9d., and assets estimated to realise £2,293 2s. 8d., from which had to be deducted £211 4s. 9d. for preferential claims, and £500 due on a debenture. The net assets therefore were £1,581 17s. 11d., a deficiency, so far as the creditors were concerned, of £12 15s. 10d. The assets consisted of plant and machinery, £922 1s., estimated to realise £500; deposits, £4; good book debts, £709 2s. 8d.; doubtful and bad debts, £114 16s. 8d., valued at £80; and stock, £1,750, expected to produce £1,000. Mr. Booth reported that the values estimated to be realised in the statement of affairs were as a going concern. If a forced realisation had to take place, he was afraid that nothing like the figures shown would be realised. A resolution was passed confirming the voluntary liquidation of the company, with Mr. Booth as liquidator, whilst a committee was also appointed consisting of the representatives of Van der Hoeks, Ltd.; Evans, Sons, Lescher, and Webb, Ltd., and R. Sumner and Co., Ltd. It was stated that the business had been advertised for sale as a going concern. Among the creditors are the following: British Drug Houses, Ltd., £26; Sumner and Co., Ltd., £38; Van der Hoeks, Ltd., £45; and United Glass Bottle Manufacturers, Ltd., £44.

Trade Returns for December

As The Chemical Age goes to press the Board of Trade returns for December have been issued. The figures for chemicals, drugs, dyes and colours are: imports, month ended December 31, 1926, £1,382,052 (an increase of £69,000 on the same period in 1925), year ended December 31, 1926, £15,443,896 (an increase of £1,059,043); exports, month ended December 31, 1926, £1,441,001 (a decrease of £323,833), year ended December 31, 1926, £21,638,544 (a decrease of £1,986,658); re-export of imported products, month ended December 31, 1926, £69,284 (a decrease of £32,176), year ended December 31, 1926, £986,408 (a decrease of £224,564). An analysis of the figures will appear as usual in next week's issue of The Chemical Age.

Company News

CANADA CEMENT CO.—A quarterly dividend of 2 per cent. is announced on the common stock.

ELECTROLYTIC ZINC CO. OF AUSTRALASIA.—At a meeting of the board of directors on January 11, a dividend at the rate of 12 per cent. per annum for the six months ended December 31 last was declared on the whole of the preference and ordinary shares in the capital of the company, due and payable at the registered office of the company on March 4, 1927. Dividend is the same as at this time last year.

CASTNER-KELLNER ALKALI CO.—The net profit for the year ended September 30 was £210,928 (as against £296,557 in 1924 5), and £28,008 was brought forward, making £238,936 available. The final dividend is 14 per cent., bringing the rate for the year up to 22 per cent.—the same as for each of the last two years. The amount carried forward is £18,396. In the last accounts, £70,636 was put to the reserve, making it £150,000, and there was a suspense account of like amount.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

SUPPLY AND ERECTION OF BITUMINOUS ASPHALTE MIXING PLANT.—The municipality of the city of Port Elizabeth (South Africa) are inviting tenders, to be presented by February 24, 1927, for the supply and erection of a plant of the stationary type covering the whole cycle of operations necessary for the manufacture of bituminous asphaltic mixtures or tar macadam. (Reference A.X. 4045.)

AGENTS SERVICES OFFERED.—The managing director of old-established general export merchants, shortly proceeding on a visit to the company's representatives and connections in the Argentine, Brazil, and other parts of South America, is prepared to undertake one or two additional representations of first-class manufacturers; also personally to investigate and report upon market requirements and opportunities for export development of special lines, and to execute private and confidential commissions. (Reference No. 673.)

APPARATUS FOR MATERIAL TESTING.—The Royal School of Engineering at Giza, Cairo, is calling for tenders to be presented by February 5 for scientific and electrical apparatus and machines for material testing. (Reference No. B.X. 3156.)

Tariff Changes

ITALY.—The Italian *Gazzetta Ufficiale* of December 23 contains a decree, dated December 12, which adds to the list of goods which may be imported into Italy duty free under the "temporary importation" regulations alizarine, for dyeing cotton yarns and tissues turkey red.

SPAIN.—The *Gaceta de Madrid* for December 16 contains a Royal Order, dated December 14, which suspends the application of the Spanish export duties on pyrites and other iron ores containing up to 1 per cent. of copper.

UNITED STATES OF AMERICA.—A proclamation was issued by the President of the United States on November 27, increasing the import duty on methyl or wood alcohol (or methanol) from 12 to 18 cents per gallon under the provisions of Section 315 of the Tariff Act (*i.e.*, the "flexible tariff" provisions). The investigation held by the Tariff Commission in accordance with the above-mentioned Section of the Tariff Act established the fact that Germany was the principal competing country. Under Section 315 of the Tariff Act the new duty came into operation thirty days after the date of the proclamation, *i.e.*, on December 27.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to February 5, 1927.

"ALBERTOL."

472,311. Class 1. Chemical substances used in manufactures; and lacquers and varnishes. Chemische Fabriken Dr. Kurt Albert Gesellschaft mit beschrankter Haftung (a company incorporated under the laws of the German Republic), Landgrabenwg 14, Amoneburg, near Biebrich-on-the-Rhine, Germany; manufacturers. August 16, 1926.

"SWANBLEACH."

474,895. Class 1. Water softening preparations. Lever Brothers, Ltd., Port Sunlight, Cheshire; manufacturers. November 15, 1926. (To be Associated. Sect. 24.)

"LUSTRAPOL."

475,442. Class 1. A finishing and sizing preparation for textile fabrics. Brown and Forth, Ltd., 21, Farringdon Street, London, E.C.4.; chemical manufacturers and merchants. December 2, 1926.

"GENOPHOS."

Class 2. Phosphates, being fertilisers. The Basic Slag and Phosphate Companies, Ltd., 67, Queen Victoria Street, London, E.C.4; chemical manufacturers. November 17, 1926.

"SYNTHOS."

473,284. Raw or partly prepared vegetable animal and mineral substances used in tanning. Class 4. Murphy and Son, Ltd., The Cedars, Sheen Lane, Mortlake, London, S.W.; technical chemists. September 23, 1926. (To be Associated. Sect. 24.)

Opposition to the Registration of the following Trade Marks can be lodged up to February 12, 1927.

"GALOXIDE."

474,883. Class 1. Chemical substance used in manufactures, photography or philosophical research, and anti-corrosives, but not including hydrogen peroxide, and not including any goods of a like kind to hydrogen peroxide. Goodlass Wall and Co., Ltd., 42 and 44, Seel Street, Liverpool, manufacturers. November 15, 1926.

"LITHOTEX."

475,135. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives. Pictorial Machinery Ltd., 7, Farringdon Road, London, E.C.1, manufacturers. November 22, 1926. (To be Associated. Sect. 24.)

Fraud Charge Withdrawn

WHEN Robert Brownlow, 49, described as an industrial chemist and engineer, appeared on remand at Bow Street Police Court on Friday, January 7, Mr. H. A. K. Morgan, representing the Director of Public Prosecutions, said he proposed to withdraw the original charge of fraudulently incurring a debt and liability of £5,000 to Mr. Emil Otto P. F. Schwartz, and substitute a charge of obtaining credit without disclosing the fact that he (Brownlow) was an undischarged bankrupt. The defendant had also been similarly charged in respect of credits to the amount of £715 and £121 respectively alleged to have obtained from Bishop Armstrong and Co., of Goswell Road, and Stott and Hotopf, of City Road. A further remand was ordered, and upon the application of Mr. Percy Handcock (instructed by Compton and Co. for the defence) the magistrate agreed to accept bail in £500.

International Combustion Contracts

INTERNATIONAL COMBUSTION, LTD., announce that, apart from the important contract for the new super-power station for Hams Hall, Birmingham, the following contracts were also closed during December :—

For the Perak Hydro-Electric Power Station, International Combustion, Ltd., have been appointed main contractors and will be responsible for all buildings, cranes, boilers and pulverised fuel equipment, for the 12,000 KW. station to be constructed in the Malay Peninsula. Rendel Palmer and Tritton, of Dartmouth Row, are the consulting engineers.

International Combustion, Ltd., have also been awarded a contract by the Anglo-Persian Oil Co. for an extension of the boiler house plant at their Abadan refineries, Persia. This contract covers the supply of water tube boilers, the combustion chambers of which will be constructed to the well-known "Lopulco" designs, including the water cooling of the front wall. The boilers will be fired by means of "oil fuel" exclusively, but air preheating is to be used, the "Usco" plate type air preheater having been specified for this purpose.

A further important contract covers the supply of the "Raymond" pulverising and transporting equipment for the firing of a continuous billet reheating furnace of 6 tons per hour capacity for an important steel works in the North of England. This contract follows some very careful investigations and experiments over a long period of observation and very important results are confidently expected.

The work in connection with the new super-power station at Birmingham, referred to above, is for the whole of the constructional work involved, and the amount of the contract is £1,458,000.

The "Coppering" of Glass

THE following method of forming copper mirrors on glass and of putting a copper film on glass vessels is very suitable for laboratory practice, and avoids the use of unstable organic hydrazines. Into the glass vessel, which has been carefully cleaned in the usual way, is poured five c.c. of dilute ammonia having 10 per cent. of copper sulphate in solution. The solution is decolourised by the addition of three to five c.c. of warm five per cent. hydrazine sulphate solution, and about 3 c.c. of 10 per cent. caustic soda solution is then added to precipitate yellow cuprous oxide. The liquid is then boiled for a short time, and allowed to stand till evolution of nitrogen ceases. It is then poured out of the vessel, which is thoroughly rinsed. The copper mirror obtained exhibits great brilliancy. The course of the reaction is as follows: the cupric salt is reduced by the hydrazine sulphate to the colourless cuprous salt; addition of caustic soda liberates free hydrazine, whereby the cuprous oxide formed simultaneously is reduced to metallic copper. This method is described by G. Eyber in the *Chemiker-Zeitung*.

Chemical Fire Extinguishers

MR. FRANK PAULDEN, JUN., in an address to the Manchester Insurance Institute on the application of chemical knowledge to fire extinction, instanced the case of a fire in a chemical works in Lancashire where there were large risks arising from the presence of storage tanks of naphtha and benzol. Fortunately through the building ran a large number of ammonia pipes from an adjoining ammonia plant, and on the advice of the chemical expert of the firm the fire in the neighbourhood of the pipes was given full play, with the result that the pipes burst, the shop was filled with ammonia gas, and the gas, as the chemist knew it would, subdued the fire and prevented a great disaster. Mr. Paulden pointed out that new problems for insurance companies were continually arising from the rapid advance in industrial science, and that a knowledge of chemistry was exceedingly valuable not only to secure the extinction of fires but to determine the cause of many fire losses.

Safeguarding of Industries: Translucent Tableware

THE previously announced arrangements for the meetings of the committee on tableware of translucent pottery have had to be altered. The further meetings will now be held on January 17, at 10.45 a.m., and on January 18, 19, 24, 25, 31, and February 1 and 2, at 10.30 a.m., in Quadrangle Court A, Royal Courts of Justice, Strand, London, W.C.2. At the meeting on January 18 evidence will be taken in camera.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette, &c.

Companies Winding Up Voluntarily

OROPUCHE (TRINIDAD) OILFIELDS, LTD. (C.W.U.V., 15/1/27.) By special resolution, December 22, confirmed January 7, S. F. Martin, 4, Broad Street Place, London, E.C.2, appointed liquidator. Meeting of creditors at liquidator's office, on Monday, January 24, at 11 a.m. Creditors' claims by February 24.

STANDARD ANHYDROUS AMMONIA COMPANY OF GREAT BRITAIN, LTD. (C.W.U.V., 15/1/27.) By special resolutions, passed December 16, confirmed December 31, M. C. Spencer, of 3, Frederick's Place, Old Jewry, London, E.C., appointed liquidator, and authorised to consent to the registration of a new company of similar name. Meeting of creditors at the offices of the liquidator, on Tuesday, January 18, at 12 noon. (All creditors have been, or will be, paid in full.)

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

BISSELL, S. S. J. (trading as WOODBROOK DRUG CO.), Vale Place, Merridale Street, Wolverhampton, chemists' sundriesman. (C.C., 15/1/27.) £17 15s. 6d. November 30.

New Companies Registered

BOOTS, LTD., 37, Station Street, Nottingham. Registered as a "private" company on January 8. Nom. capital, £50,000 in £1 shares. General storekeepers, chemists, traders, merchants, etc., and to carry on all kinds of chemical or scientific research, exploration and development, etc. Subscribers: J. Campbell Boot and H. R. Gillespie (directors of Boots Pure Drug Co., Ltd.).

BRITISH ROTARY FILTER COMPANY, LTD., The Grimshaw Street Foundry, Preston, Lancs. Registered January 1. Nom. capital, £5,000 in £1 shares. Chemical, electrical, and mechanical engineers, founders, dealers in pharmaceutical and other preparations, etc. Directors: J. N. Clay, The Manor House, Thornton in Craven, Skipton. Mrs. R. H. Clay, W. Dryden, and H. J. Talbot.

CROBERTS, LTD., 4, Vincent Street, Bradford. Registered January 7. Nom. capital, £2,500 in £1 shares. Manufacturers of and dealers in chemicals, tar products, road materials, oils, rubber solutions, industrial, pharmaceutical and other preparations, etc. Directors: C. Roberts, 120, Duchy Road, Harrogate (chairman and permanent director), A. E. Battle, and I. Binns.

HEDLEY-THORNTON SALES CORPORATION, LTD., 17, Shepherds Bush Green, W.12. Registered January 7. Nom. capital, £100 in 1s. shares. Analytical and manufacturing chemists, wholesale druggists, drug grinders, etc. Directors: C. J. Hedley-Thornton, 17, Shepherds Bush Green, London, W.12, R. D. Scoular, and F. C. Mallet.

THE STANDARD ANHYDROUS AMMONIA CO., LTD., 37–39, King William Street, E.C.4. Registered as a "private" company on January 6. Nom. capital, £92,500 in £1 shares. To acquire from the Standard Anhydrous Ammonia Co. of Great Britain, Ltd. (vendor company), and its liquidator, the property and assets referred to in an agreement with that company, and to carry on the business of dealers in chemical substances, chemical manufacturers and refiners, manufacturing chemists, artificial manure manufacturers and dealers, etc. Directors: F. Lennard, R. G. Perry, S. Jackson, J. G. Nicholson, F. L. F. Lennard, C. Page.